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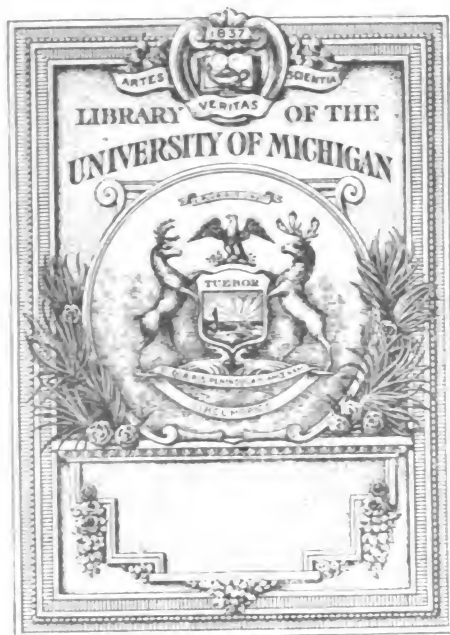
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PSYCHOLOGY AND SCIENTIFIC METHODS

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PSYCHOLOGY

AND

SCIENTIFIC METHODS



EDITED BY

FREDERICK J. E. WOODBRIDGE

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WENDELL T. BUSH

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

A STUDY OF PURPOSE. I

INTRODUCTION: TELEOLOGY AS A SCIENTIFIC PROBLEM

THE tendency to interpret natural phenomena in teleological terms dates back to the very dawn of human thought. Mythology and primitive cosmology are largely an attempt to explain history as a progressive fulfilment of the purposes of the gods. Philosophy and science till recently laid special emphasis on motive and design. The earth was believed to have been created expressly for human habitation. Animals and plants were formed for the sake of ministering to human needs. The abundance of air and water, the great excess of oxygen, carbon, hydrogen, and nitrogen over other less important elements, was believed to have been predetermined on account of their peculiar utility to life, especially the life of man. In biology the adaptation of organs to their functions was too obvious not to suggest design and prevision. The periodicity of annual plants and the seasonal modifications of certain animals seemed prearranged to harmonize with the length of the solar year. Psychology discovered a pattern for all purposive relations in the voluntary activity of man. In human purpose the result to be attained is first pictured in consciousness, and the thinker then proceeds by a series of acts to fulfil his preconceived aim.

The past few decades have seen many of the traditional teleological interpretations of nature vigorously challenged. When cosmic history came to be read in terms of evolutionary progress, the earlier anthropomorphic conceptions of stellar and terrestrial creation were inevitably swept away. More recently, following the acceptance of biological evolution, the older teleological views concerning adaptation of living forms to their environment and of structure to function have required drastic revision.

Some biologists still cling to the teleological standpoint in interpreting organic evolution, and are seeking to reformulate the old vitalistic philosophy in modern scientific terms. On the other hand, not a few earnest investigators, men of rigorously scientific ideals,

are striving to banish the concept of purpose from biology altogether. They aim to interpret the evolution of species and organs in a strictly mechanistic manner. Among psychologists to-day there is a similar division into voluntarists and psychophysicists. The latter seek to minimize the efficiency of volition and to describe all human acts in terms of psychophysical activity. This would seem, in the last analysis, to involve an interpretation of purpose in physiological terms, as a series of physicochemical changes.

These differences in standpoint can scarcely be attributed to carelessness of observation. They depend rather upon certain underlying concepts and modes of thinking which govern the scientist's interpretation of observed facts and determine the character of his world-view. Among these fundamental logical notions none is more deep-seated and persistent than the concept of Purpose.

Notwithstanding the vigorous controversy that has recently waged between vitalists and mechanists, and the forceful arguments put forward in behalf of teleology and against it, neither side has so far given an adequate account of the *nature* of purpose itself. A thorough examination of its fundamental character might reveal a middle ground on which the two opposing parties could unite. If we rid teleology of its anthropomorphic accretions, as Hume removed the anthropomorphic notion of "necessity" from causation, there is no reason why the most thoroughgoing mechanist should not accept purposive events as a specific class of natural processes. It is possible, also, that when the scientific untenability of the traditional voluntarism is demonstrated, the vitalist will attach more weight to physicochemical processes in biological growth and activity.

One obstacle to a thorough understanding of the nature of purpose is the present lack of coordination between the various sciences. Biologists for the most part assume an interpretation of human volition drawn from the psychology of a bygone generation. Psychologists still lay stress on the unscientific notions of "free will" and "responsibility" bequeathed to us by medieval philosophy. The data derived from cosmology, biology, and psychology have not yet been united into a consistent, scientific interpretation of voluntary, teleological action.

A thoroughgoing analysis of purpose is one of the prime needs of empirical science to-day. Every branch of natural science requires a clarification of this notion. The newer conceptions of change and growth induced by the evolution theory make it essential to determine what scientific meaning shall be attached to the phenomenon of "anticipation" and the judgment of "fitness."

Psychologists and biologists alike are vitally concerned in the solution of the teleological problem.

Genetically, the notion of purpose arose from a certain definite type of human experience. The typical purposive experience consists in a thought of some future occurrence followed by a series of actions which culminate in the very situation which the original idea represented. Thus we have a temporal sequence beginning with an *idea* and ending with the *perception* of a situation or event corresponding to that idea. Whether or not the "idea" produces the "physical situation" in a causal manner, at least the temporal succession is a matter of common observation, and this order is the reverse of the usual sensation-memory sequence. It is experiences of this type that have given rise to our general notion of purpose, teleology, volition, means to end, adaptiveness. On historical grounds, therefore, it seems fitting to begin the study of purpose with an analysis of purposive *consciousness*. Whatever the scientific interpretation of the phenomena may be, the occurrence of conscious "forethought" and its subsequent "fulfilment" through human acts is not open to question.

The biological problem of purpose is closely related to the psychological problem. Biologists find that certain responses are made to situations which do not develop fully till after the reaction is actually begun. In other words, a reaction may in a measure anticipate the situation to which it is a response. But apart from "conscious anticipations" such reactions are based upon organic structure which has slowly evolved in the species and developed in the individual. The biological problem of teleology, then, is to account if possible for the phylogenetic and ontogenetic rise of anticipatory reactions, and to determine their scientific significance.

A further problem is concerned with the trend of cosmic and terrestrial evolution. The history of the stellar universe and of the earth itself may or may not admit of a teleological interpretation. In the past it has generally been assumed that the universe was definitely planned from the beginning and that it is working toward a certain foreordained goal. What attitude shall science take toward this deep-rooted hypothesis? Can modern research throw any new light on the trend of cosmic history? Whether or not a scientific investigation of the problem will lead to a definite solution, at least it opens up a legitimate field for scientific study. Science to-day stands face to face with the problem: What is the place of "purpose" in the universe as a whole?

Three distinct lines of scientific inquiry, then, are indicated: (1) *The psychological analysis of purpose*.—What are the distinctive features of purposive states of consciousness? (2) *The biolo-*

gical history and meaning of purpose.—How did purposive behavior originate and develop in organisms? Does this type of activity harmonize with the physicochemical interpretation of vital phenomena? (3) *The rôle of purpose in the universe.*—Is there scientific evidence of a teleological sequence in the inorganic world? Shall the scientific thinker adopt a thoroughgoing mechanistic standpoint as his working hypothesis in interpreting the cosmos? Or, shall he assume the existence of an underlying entelechy, which directs the course of cosmic evolution?

PART I. THE PURPOSIVE CONSCIOUSNESS

A human act is said to be purposive when it is preceded by an idea representing the situation which the act itself brings about. The antecedent idea is termed the purpose or forethought, and the resulting situation is called the end or fulfilment. The whole sequence from idea to fulfilment constitutes purposive activity. The peculiarity of purposive activity (as experience) is that the representation of the situation *precedes* the presentation, while in ordinary experience the representation of a situation *follows* the presentation.

In analyzing the consciousness of purpose it is customary to select acts which involve a considerable amount of preliminary deliberation. But many simple acts which are performed without deliberation contain the essential features of purpose and are quite as typical. The analysis is made easier if we select these simpler acts for study.

For example, I am reading and it grows dark. I think of turning on the electric light, and without hesitation the action is performed. The act here described is just as purposive as if I had deliberated and planned out every step in the procedure beforehand. In psychophysical terms, the experience involves a thought representing a future situation, followed at once by the appropriate reaction. The characteristic of a conscious experience which distinguishes it as purposive, is that the antecedent thought shall picture or symbolize a situation which subsequent muscular activity brings about. In psychological terms, the mental picture of the act precedes the perception of the act as an actual occurrence. Whether the thought itself is to be regarded as the cause or starting-point of the chain of physiological events will be considered later.

Purposive consciousness is observed directly only through personal experience. But its presence in another individual, like the presence of mental data generally, may be inferred from the character of his reaction or from his verbal report. The psychological

study of purpose is therefore not limited to subjective investigation.

Upon examining the purposive consciousness we observe a number of factors, some of which enter into all purposive experiences, while others occur only in special cases.

1. Every purposive experience begins with an idea of some future situation. This idea is the fundamental factor in every purposive experience. It may be termed the *forethought*. A forethought is the starting-point of a series of events which usually culminate in a perception corresponding to the forethought. The purposive character of the experience, however, is usually recognizable before the series is completed.

2. Another characteristic factor which appears at the beginning of the purposive experience is variously known as decision, wish, or *assent*. Assent distinguishes a purposive series from a sequence in which the idea is fortuitously fulfilled. An idea may chance to be followed later on by a sensory situation corresponding to it without there being any significant relation between the two. Day-dreams sometimes come true. A forethought is not purposive unless accompanied by a consciousness of assent, either as a separate associated experience or as a feeling-tone of the forethought.

3. A feeling of *potency* is commonly associated with the forethought. There is a strong tendency to believe that the forethought itself has power to produce the result foreseen.

4. A further characteristic of purposive events is that the individual himself is directly concerned in the outcome. One's purposes are not fulfilled by another. The *consciousness of self* may or may not be explicitly associated with the forethought; but the *self* is always implicitly involved in purpose.

5. During the progress of purposive activity there frequently appears a thought or feeling that certain thoughts or perceptions are suitable or *fit*. In contrast with this a feeling of *unfitness* is associated with other elements in the experience. The fulfilment itself is marked by a feeling-tone of fitness if the experience is in the focus of attention.

The mental states which intervene between forethought and fulfilment may or may not include experiences of a purposive character. I think of turning on the light and proceed forthwith to perform the act without further thought of ways and means. This is typical of habitual actions. Here the intermediate phases of consciousness are not purposive. I perceive the changed positions of objects as I rise and move across the room. But these perceptions in no way tally with my forethought; they are no more purposive than the

set of experiences which I have when some one else comes in and walks over to the switch.

Where the act is novel or complex, experiences of a purposive character frequently occur during its progress. For example, many years ago I thought of making a life-work of psychology. Meanwhile many thoughts have arisen representing certain phases of this work. These intervening experiences are purposive. They are forethoughts of which my professional goal is the fulfilment.

The consciousness of purpose may be greatly syncopated. In simple, habitual acts, as we have seen, it consists merely of a forethought tinged with assent. Even where the act is very complex the accompanying experiences, however varied they may be, include no purpose factors other than the five already mentioned. Let us examine these characteristic factors in detail.

1. *Forethought*.—The forethought may be simple or complex. It may be either an image or a symbolic thought. For example, when I propose to turn on the light, the forethought may consist of a kinesthetic image of rising, an auditory image of my footfalls, a visual image of the electric switch, a tactile-kinesthetic image of turning the switch, a visual image of the flood of light, etc. Any one of these images may be present alone, or several of them together.

On the other hand, the act of lighting may not be preceded by any *image* corresponding to the future sensory experience. Instead there may be a *verbal* experience of one type or another; I may have either an auditory or a vocal representation of the word "light." Here there is no resemblance between the forethought and the perceptions which accompany the fulfilment. But the two experiences correspond through the arbitrary symbolic association between word and image. To think of lighting in symbolic verbal terms is quite as purposive as to think of the result in terms of imagery.¹

The precise sensory character of the idea or image constituting the forethought is of no moment in this analysis. It varies with the individual, but these variations do not affect the character of the purpose-consciousness. The distinguishing mark of the forethought is its *reference to some future situation*.

Regarded from the psychophysical standpoint, in purposive events an image or idea is the stimulus which produces the corresponding physical situation, whereas in ordinary events a physical situation is the stimulus which arouses the corresponding mental state. From a purely psychological standpoint, the image precedes

¹ In order to avoid the problem of imageless thought, which is irrelevant to the present discussion, we may confine the term *image* to images which resemble the sense-perception of a situation, and use the term *idea* to denote symbolic verbal experience. The vaguer term *thought* will cover both image and idea.

the sensation in purpose-experiences, while in ordinary experiences the sensation precedes the image. In other words, the usual temporal order of certain events is reversed. The photographic picture of a physical situation endures after the situation has passed away; the record of an event remains after the event has been completed. Neither the photograph nor the record anticipates its prototype. But in purposive phenomena the mental picture or record *anticipates* the primary consciousness which it represents. Anticipation is the fundamental characteristic of the purposive experience, just as it is the distinctive feature of objective teleological events.

In the analysis of purpose an attempt is frequently made to distinguish between the final result and the means which produce this end. On the psychological side such a distinction does not appear justified. The idea of the *means* is a purposive thought of substantially the same sort as the idea of the *outcome*. I may think of rising and of turning on the light. Each of these ideas is a forethought. I may think of the entire sequence of events beginning with rising, then walking across the floor, and finally turning the switch. Each member in the series is a forethought which is fulfilled in turn. The final outcome is distinguished only as being the last term in the series which is perceptualized.

Sometimes the original end is transformed into a means for some ulterior end; or again, the means may come to be regarded as an end in itself. In the example given I may think of rising from my chair because I have finished reading, and without thinking as yet of any further action. Thus far the thought of rising is the end. But before starting to rise I may think of turning on the light. The act of rising then becomes a means and the act of turning on the light becomes a new end. Or, having thought of rising and turning on the light, I may rise and then continue pacing to and fro without completing the act. Here the means has become the end.

Ordinarily we think first of the end, then of the means. In the example given, the first thought was to continue reading in spite of the gathering darkness. The next thought was to turn on the light. Last of all came the thought of getting up from the chair as a precursory step to the act of lighting.

There is nothing especially unique about the end-thought or final purpose, as distinct from the idea of the means. Events continue to succeed one another indefinitely. The final result is not like the end of a chalk-line which is essentially different from all other points on the line. It is merely the furthest point that is considered in the series. In the given instance I may not at the time have a definite thought of any end beyond the act of continuing to read. But before I started to read this particular book I had thought of acquiring

ing information on psychology; and many years before that I had definitely determined to pursue psychological study as an aim in life. Thus, taking into account not merely my mental state at the time when I think of turning on the light, but my whole mental history so far as relevant to the act, we discover certain experiences which may be considered as both means and end. The thought of reading the book is not merely an end, but a means to a broader outlook on life.

Some forethoughts are never completely fulfilled. We have ideals which constantly attain partial fulfilment through our actions; but since they do not represent specific acts, we experience time and again new situations to which they correspond. The conception of one's life-career is perhaps the best instance of a general purpose. An ideal is analogous to the general notion. But unlike the ordinary general notion it is not the outgrowth of a number of particular experiences which have gone before; an ideal arises *before the particulars* to which it corresponds. In the general purpose, as in the specific purpose, the usual time order is reversed: we particularize, a general experience, instead of generalizing particular experiences.

The essential feature of the purposive consciousness, then, is the prevision or forethought of certain future events. We may picture the whole progress of events in rather minute details; or we may merely pick out one or more salient parts of the series to image or symbolize. The latter is more usual. In either case the distinguishing mark of the forethought is its "future reference." This is analogous to the "past-reference" which characterizes the memory image.

2. *Assent*.—Not every thought of the future is purposive. An additional factor, accompanying the purposive forethought, serves to distinguish it from mere imagination of the future.

When I think of performing some act, such as turning on the light, my thought is sometimes followed by the act itself or by the beginning of a series of actions culminating in the result foreseen. In other cases the act is not initiated, although much the same thought is present. The fulfilment may be merely delayed, as when I think of reading Condillac, but take no steps at present to do so. Or the thought may occur without the slightest intention of putting the act into realization. For example, one may picture himself ascending the Matterhorn, and yet have no desire whatever to perform the feat. Where the fulfilment is merely delayed, the forethought is still purposive; where there is no intention of actually accomplishing the result, the purposive character of the experience is lacking.

The differential mark is a certain conscious datum added to the forethought. It is a consciousness of intention, decision, or volition,—of wish, desire, or assent. This distinguishing factor occurs in many different forms and degrees. Usually it is not a separate experience, but rather a modification of the forethought. The mental attitude in portraying the coming act is not wholly intellectual. It is distinctly affective, like the consciousness of “need.”²

The nature of assent is observed by comparing a purposive idea with a mere imagination. Contrast the thought of perusing this paper with the thought of a journey to Mars. Each is an idea which refers to some future activity. But our attitude in the two cases is quite different. In the former experience there is a feeling of “actually fulfilling the idea,” which is lacking in the latter. This affective datum distinguishes a purposive forethought from a non-purposive imagination of future happenings. In purposive experiences an affective element of this sort is observable even where there is no separate idea of decision.

If we analyze the assent factor we find that it consists of kinesthetic and organic data. When we think of an act in a purposive way there is an incipient tension of the muscles concerned in the movement, and of the finer muscles which produce an adjustment of attention. This is often accompanied by modifications of breathing and circulation. The sensory impulses set up by these kinesthetic and organic adjustments are usually too weak to arouse definite sensations; but they combine to produce an indefinite conscious attitude. This datum is the assent.

Assent to a future experience corresponds very closely to recognition of a past experience. The recognition element in an image is traceable to changes in adjustment brought about by repetition and facilitation; the sensory impulses which these changes arouse do not produce separate sensations, but form the recognition factor in memory. The origin of assent is analogous to this; in each case the datum is partly affective, partly ideational.

Some psychologists assume that, in addition to assent, another factor immediately precedes the initiation of activity. This is known as the *fiat*. I do not observe any such factor, distinct from assent, in my own experience. The thought of turning on the light is followed immediately by rising, walking, etc. Nothing else is ex-

² The term *assent* seems to express the meaning of the experience most nearly. It implies an affective consciousness, with or without a separate idea of initiating the action. *Wish* and *desire* emphasize the affective side overmuch, while *intention* lays too great stress on the idea. *Decision* and *volition* are used to designate complex purposes which involve reflection and delayed fulfilment; they imply certain dynamic experiences not found in simple purposive consciousness. I therefore prefer the term *assent*.

perienced meanwhile but the assent. In cases of complex and delayed purposes the assent factor is intensified and becomes more fully separated from the forethought. "I will write this paper." "I will begin it *now*." Whereupon my hand slips over to my pocket and I take out my pen. There is no intervening *fiat* consciousness.

What distinguishes delayed fulfilment from immediate action? It is certainly not the degree of desire, for we find all degrees of desire present in each case. There is a minimum degree of desire associated both with turning on the light and with reading Condillac. The former is performed; the latter is not. There is a high degree of desire associated with writing this paper, which I am proceeding to do; and there has been for years a high degree of desire associated with making a trip to Japan, which I have taken no steps whatever to accomplish. The function of desire is only to increase the intensity of the forethought and thus render its accomplishment more probable.

Nor is the delayed execution due to absence of assent. An act whose fulfilment is postponed may be assented to quite definitely. I assent to the thought of reading Condillac in the same way that I assent to turning on the light, although in the one case I have not proceeded to the fulfilment of the thought these many years, while in the other case the fulfilment is accomplished immediately.

Whether or not the act follows immediately upon the assent depends on psychophysical conditions. The beginning of the act may be delayed by an inappropriate situation, by unforeseen hindrances, or by a long succession of thoughts while we plan how to act. When at length the act does begin it is not preceded by a new sort of factor. There is no magical *fiat* to squeeze the muscles or start a current down the motor nerves. The assent factor is the only differentia between purpose and sheer imagination.

So far we have considered chiefly the purposes which find their fulfilment in objective situations and expressions of behavior. But certain purposes are concerned primarily with ideational states. I endeavor to think of the name of a former student. I propose to solve a problem in chess, to find the answer of a mathematical problem, to arrange a schedule of hours, to perfect a laboratory device, etc. In such cases the solution, the fulfilment of the purpose, is a thought rather than an act.

I do not propose to empty two real hogsheads by pipes of different diameters, but only to obtain an idea of the result. I may or may not repeat the chess moves on a real board; but if I do play them out, my original purpose has already been fulfilled; I am now endeavoring to *verify* my solution, and this is altogether another purpose. I perfect my laboratory device in thought and then con-

struct the machine; here there were two purposes in mind—one ideational, the other having an objective sensory fulfilment.

In ideational purpose the forethought does not exactly represent the outcome. I do not think of the student's name in the forethought of recalling it. The outcome is something more specific than the forethought. The forethought is a problem; the fulfilment is its solution. The intervening process frequently involves long-continued "hard thinking." So long as this thought-series does not serve to fulfil the purpose, the forethought remains focal; I am continually aware of my purpose to solve the problem.

The assent element usually appears later in subjective purposes than in motor acts. The formulation of the problem seems to entail one or more attempts at solution even before we decide to solve it. It is sometimes difficult at the start to distinguish between a train of fancy and a purposive thought-train.

Apart from this delay in appearance there seems to be no essential difference between the assent factor in thought problems and purposive behavior. The two manifest the same characteristics as regards attention. Where the purpose to be attained is something habitual, the assent becomes marginal whether the fulfilment be a thought or an act. The problem of determining the value of $2 + 3$ is solved as quickly as the problem of rising, and the assent in both cases is marginal. On the other hand where the purpose is novel, and especially where it is fulfilled through trial and error, the assent is apt to remain in the focus of consciousness throughout the process. In fleeing from a mad dog, the thought of escape is vividly present during all my movements and is attended by a strong degree of assent, just as the thought of solving a chess problem remains focally present throughout the ensuing train of thought. One series is accompanied by muscular contractions and kinesthetic sensations, the other by cerebral activity and thought processes. The sensory basis of the assent consciousness is different in the two cases, but I find no distinction between the two types of assent so far as their relation to fulfilment is concerned.

The psychological analysis of purpose has been seriously hampered by the complicated examples that are usually chosen for examination. In an intricate, complex purpose, such as determining one's attitude toward a moral issue, there is apt to be a long succession of thoughts, known as deliberation, and the assent which marks the final passage from central activity to muscular activity is often an epoch-making affair involving considerable readjustment of one's entire attitude toward life. Such crucial experiences are dignified with the name of decision or volition. I do not find in my own case that the purposive character of these complex experiences is

different from that of simple purposes such as turning on the light. Simple purposive experiences occur hundreds of times in every-day life, while these complicated instances are rare. It is true the latter involve more intense consciousness, and the assent feature is separated out into a distinct and vivid experience. But the assent element is the same; it is merely magnified.

Volition has proved a serious stumbling-block in psychological analysis. The vague connotation of this term has too often led to mystical interpretations of mental phenomena. The notion of assent derived from simple types of purpose is less open to objection. It is readily freed from anthropomorphic excrescences. There appear to be no difficulties in the way of applying it to the most complex purposive experiences. The usual connotation of assent embraces the essential characters of "decision" as a psychological datum. On the other hand it does not include the dynamic factor, the feeling of potency in the forethought, which analysis shows to be a distinct element in the purposive experience. The failure to distinguish "assent" from the "feeling of potency" is largely responsible for the unscientific character of the traditional theory of volition. The importance of this distinction will appear when we examine the third factor in purposive consciousness.

3. *Potency-feeling*.—In complex purposes which involve deliberation, a certain dynamic feeling accompanies the assent. We feel that conscious volition initiates the activity itself—that the decision innervates the muscles.

A generation ago certain states of consciousness were termed "innervation-feelings"; they seemed to demonstrate the power of thought to bring about an action which is conceived and desired. More recently these so-called innervation feelings have been traced to incoming excitations from the muscles. They prove to be kinesthetic sensations due (a) to the state of the muscles prior to action, or (b) to changes in muscular tension during the activity itself; or (c) to memory images of such kinesthetic sensations. That these dynamic experiences are really of peripheral origin, that they are the result and not the antecedent of muscular activity, was demonstrated most convincingly by Professor Münsterberg in his "*Willenshandlung*." Psychophysical investigation and introspective analysis both lead to this conclusion.

These dynamic experiences are closely related to the assent attitude. In motor activity the assent attitude is found to be an incipient kinesthetic sensation which is aroused when our muscles begin to be tense for the movement. When thought is succeeded by actual movement, this kinesthetic sensation becomes stronger. It appears as a sensation of power or force. A corresponding sense

of power is associated with the forethought even before the motor activity begins. This is found to be a memory image of former kinesthetic sensations, which is aroused by association when the muscular activity is represented. Observation of the experience indicates that the data are the same at every stage. In other words, the feeling of potency or efficiency in volition is really a kinesthetic sensation or memory. Its presence does not guarantee that the motor consciousness is *really efficient*—that the thought of an action actually has power to call forth the corresponding action.

According to the ideomotor theory of action a motor idea tends to produce the corresponding act; it has an inherent power to select the appropriate activity from among all other possible modes. Professor Thorndike in his presidential address before the American Psychological Association³ argues forcefully against this view. There is no more reason, he maintains, that a mental image should be followed by an action which resembles it, than that the thought of an earthquake should be followed by an earthquake. His strictures apply to all purposive acts. There is no inherent reason why the thought of rising should be followed by the act of rising, or the thought of taking out a pen by that action itself. Nevertheless, it is a matter of observation that the thought of a specific act is frequently followed by the performance of the corresponding act.

The sequence of a thought and the corresponding perception constitutes the fulfilment of purpose. How has this tendency toward fulfilment come to be, if not through some selective power in the forethought? Speaking in psychophysical terms, by that means does the thought of a situation tend to start physiological processes which lead to the actual production of that situation? Professor Thorndike explains this tendency solely on the ground of utility. A thought tends to be followed by the act which it resembles because such a sequence has proved biologically useful.

The genesis of purposive behavior will be considered more fully in the second part of this paper. Our present analysis is concerned with the *conscious accompaniments* of purposive behavior. Here the problem appears in a slightly different form: How comes it that the purposive thought tends to be followed by the perception of its fulfilment, rather than by any one of a thousand other dissimilar perceptions? I believe that Professor Thorndike's answer applies equally well to this aspect of the problem.

Mental association is based upon frequency and intensity. The associations between a forethought and the corresponding motor perception are strengthened through repetition and through the interest which attaches to them. If a sensation of seeing or smelling

³ "Ideomotor Action," *Psychol. Review*, March, 1913.

food happens to be succeeded by a series of kinesthetic sensations, followed by a pleasant taste, the next time a similar visual or olfactory sensation occurs it will tend to the same motor expression, and at the same time it will tend to recall the kinesthetic memories and the pleasant gustatory memory of the former experience. By repetition, then, not only is the association between the food-perception and the food-getting act (with kinesthetic accompaniment) strengthened, but an association is built up between the food-getting *thought* (gustatory and kinesthetic memories) and the food-getting *act*, which is pleasurable; and each repetition serves to strengthen this association. That the original association is not due to any ideomotor potency is shown by our inability to produce a sneeze, however vividly we recall its motor sensations. That a motor association requires some "cue" is shown by the fact that in certain individuals the thought of moving the ears may be followed by the act (and its perception), while in most persons this thought, however vivid, never leads to fulfilment.

The examples cited by Professor Thorndike seem to refute conclusively the view that the forethought possesses an autonomic selective power over kinesthetic experiences. If the thought of an action leads to the production of that particular action with all its kinesthetic sensory accompaniments, rather than to any one of the thousands of other kinesthetic experiences, the reason is that a definite association has been already formed between this particular thought and this particular motor impulse. The origin and growth of such an association may be attributed to chance concurrence, frequent repetition, and value; it is not due to some mysterious and magical potency residing in the thought. The thought of a muscular action has no more power *per se* to produce the corresponding kinesthetic sensations than the thought of an earthquake has power to produce the sensation of an earthquake.

A conscious purpose, as we have seen, may consist in the formulation of a problem which is to be solved in *thought* rather than action. Professor Thorndike does not examine this case specifically; but it is quite analogous to the other. Just as in the case of ideomotor activity, most of us have a very deep-rooted belief that the thought of solving a problem has a directive power which guides us to its solution. Does the evidence justify this belief?

When I propose to recall a forgotten name, I sometimes succeed in recalling it immediately, while at other times I fail completely. In the latter case it frequently happens that if I abandon my purpose definitely after the vain attempt, the name sought for suddenly "comes to consciousness" in some apparently irrelevant connection. A conscious purpose to recall thought, so far from hav-

ing the power to accomplish the end desired, is often quite powerless to do so; indeed it sometimes seems to have an *inhibitory* effect. Forethought and afterthought are thus seen to be connected only through ordinary associative processes,—not by some directing potency. The result proposed may be attained, or again it may not be fulfilled in spite of our most earnest endeavors.

Take a higher type of thought, where the result involves a process of reasoning. Let one endeavor to find the next prime number greater than 47. Here the thinker's training in mathematics leads him to form certain associations. He examines in turn 48, 49, 50, etc. One number after another is discarded as its divisors are discovered, till the right one is reached. Perhaps the operator inadvertently omits one test and reaches the conclusion that 51 fulfils the conditions. Here the purposive thought has led to a mistaken end. Such erroneous conclusions are by no means rare. Even the experienced mathematician and logician blunder occasionally. The ordinary man finds that time after time he has been satisfied with a conclusion which subsequent tests prove false. It appears then that the associations which follow a rational purpose may or may not lead to the result proposed. Rational thought, like any other thought, is capable of forming only the associations which experience has given. There is no inherent power in the forethought to induce a rational conclusion.

Again, take the case of so-called creative thought, or invention. I propose to devise a laboratory apparatus which will record a choice reaction when the subject presses the right key, but will fail to complete the circuit and stop the chronoscope when he presses any one of the three other keys. I think of various ways of wiring the circuits, and find (in thought) several which will work for most combinations; but all these arrangements fail to work for at least one type of false reaction to one of the signals. I put the problem to my assistants and graduate students. We all work with the same end in view. One of the group solves the problem, but finds that in certain cases the clock will record when the subject presses a right and wrong key *together*. Finally one of the group obtains a complete and satisfactory solution to the problem.

In this example has the forethought been effective in producing the result? Obviously not for *most* of the group engaged in the test. One man *did* fulfil the inventive purpose; but his solution was reached only after a great number of erroneous conceptions, all of which represented combinations of experiences familiar to him. Shall we say that this particular man's forethought was efficient while that of the others was not? Shall we not rather attribute his success to a greater facility in combining familiar ele-

ments into new complexes? If instead of the given problem he had proposed to himself the problem of squaring a circle, might he not still be engaged in the search for a solution?

The only real potency that can be attributed to a purpose-thought is a strong tendency to *continue thinking* about the problem. To say that a vivid thought has the effect of inducing continued associative thinking, may be a restatement of the traditional laws of association; or it may be mere tautology.

The presence of a *feeling* of potency in any purposive experience does not insure the fulfilment of the purpose. Whatever the character of the forethought, whether it refers to a motor act or to the solution of a mental problem, our belief that it actually has power to produce the result is an anthropomorphic interpretation of a psychological datum. The potency-feeling, like the assent factor, is a kinesthetic sensation or memory. Where the fulfilment is a *motor act* it may be traced to sensations of tension in the muscles concerned; where the fulfilment is a *thought* it is traceable to the finer tensions which accompany the attention process.

This dynamic feeling attains peculiar strength and vividness in certain instances. In my own case the strongest sense of "volitional potency" which can be experimentally induced is observed when I lie in bed in the morning preparing to get up. The longer I lie the more I feel the effort and the power of my will to overcome the inertia. I tingle all over with the sense of dynamic potency. Yet when I focus the attention here and there, I discover no element but the kinesthetic data; the intense dynamic experience is due to the high degree of muscular tension all over the body as I prepare to spring up. At other times, when I jump out of bed immediately after waking without stopping to reflect, no feeling of potency is noted. The forethought passes over into action without the slightest dynamic sensation. But in such cases there is no period of muscular tension before the act takes place.

Examination of all classes of experiences indicates, then, that the feeling of power in a purposive thought to bring about the situation which it portrays is a datum derived from kinesthetic sensations. This feeling does not attach to every purposive experience, but only to vivid and rather complex forethoughts. It is most noticeable where considerable deliberation precedes the assent. The potency-feeling does not guarantee the actual efficiency of the forethought. A purpose may not be fulfilled in spite of the strongest feeling of potency; and it may be fulfilled equally well when the feeling of potency is altogether lacking.⁴

⁴ A word in regard to the implications of this view. It is objected that in denying "potency" (and with it "directive selection") to the forethought we

4. *The Self-Factor.*—The thought of an act is not purposive unless the thinker himself is concerned in accomplishing it. When I think of a friend's coming trip to Canada, no matter how detailed the representation, it lacks the character of purpose.

I think of the completion of the Cape-to-Cairo railroad as an end to be accomplished; I may desire its completion. If I consider the future of the project merely as an outsider, my thought is not purposive. But if I think of some act of my own as concerned in the building of the road (if, for example, I desire to suggest a change of route), then there is a purpose on my part, provided I assent to the thought. We attribute a purposive thought to Cecil Rhodes in the Cape-to-Cairo project on account of the bequest provided in his will, though he died before the purpose was fulfilled. The bequest is an objective indication of the self-factor.

Again, if we endeavor to trace the steps that must be taken in order to complete the railroad, the thought series may involve a subjective ideational purpose on our part, like the solution of any mental problem. The purpose here is not to build an actual road in Africa, but to understand how it can be built.

In every case the situation to which a purposive forethought refers involves the thinker himself. The fulfilment of one's purpose always includes an act on his part, or an objective situation in which he is concerned, or a subsequent thought of his own.

The self-element does not usually appear as a separate factor in the experience. Only in complex cases of deliberation and so-called volition is there an explicit experience of self associated with the reduce consciousness to the rôle of an epiphenomenon. If purposive thought is not effective in producing mental or muscular activity, of what value is consciousness in the universe? Is it anything more than a passive spectator of the physical changes which constitute real activity and form the basis of history?

The objection may hold as against the traditional parallelistic world-view, but it loses force if we adopt the double-aspect standpoint. According to this interpretation our thoughts and purposes are only our way of experiencing what an independent observer might perceive as physiological activity. One set of occurrences is as "real" as the other. Neither physicochemical changes nor conscious activity is due to "compulsion," and in neither case is there indeterminate "selection" or arbitrary "direction."

If the only "value" of phenomena were to "initiate" something apart from the orderly sequence of changes, then physical phenomena would seem to be quite as epiphenomenal and useless as mental phenomena; for they too are mere recombinations of preexisting elements.

The criticism is really based upon an unscientific conception of natural events. We still incline to interpret nature anthropomorphically. We attribute power to causation and *selective potency* to purpose. These are distinctly "psychomorphic" interpretations which have no basis in the phenomena themselves. We shall refer again to this psychomorphic tendency in the second part of the paper.

forethought. But a self-factor is always implicitly present in purpose.

The explicit self-factor may be traced to kinesthetic elements which arise during the process of fulfilment. It is something more than the mere fact that the purposive experience is my own. For this is true of every experience, whether purposive or not. I observe the successive motions of a leaf wafted down to the ground; this series of perceptions forms a part of my experience, but they are not purposive. Neither is a train of fancy purposive, though it forms a closely united group of personal experiences.

In every purposive *act* the motor functions of the individual organism play a part. In every purposive *consciousness* some kinesthetic data are present between the forethought and its fulfilment. The purposive self is based on these kinesthetic data.

In ideational purpose the self-elements are merely successive adjustments of attention, and are indistinguishable from the assent. In objective purpose, though more intense, they may fail also to appear as separate data, since the attention is usually centered elsewhere. When I rise and turn the switch my thoughts are focused on my reading, not on my movements. When I write, my thoughts are chiefly on the meaning of the words, not on the muscular contractions of my fingers. Yet in every case these kinesthetic elements appear to tinge the experience. This tone value is observed most clearly when we compare purposive with non-purposive experiences. There is a personal tone to the former which is lacking in the latter.

The self-datum is the least important factor in the purposive experience. It is less characteristic than the assent, less vivid than the potency-feeling. Still it should not be ignored in the study of purpose, since in some form or other there is always a kinesthetic self-reference in the fulfilment of every purposive thought.

5. *Sense of Fitness and Unfitness*.—When the purpose is fulfilled a feeling of satisfaction is frequently associated with the perception of the completed situation. This feeling is based upon our recognition of the forethought in the fulfilment-experience. I propose to think of a forgotten name; when I do recall it I am pleased or relieved. I propose to find the word "purpose" in the dictionary; when I find it I recognize it with satisfaction as the word I was looking for. The feeling-element by itself does not seem to be in any way characteristic of the purposive consciousness; it is the same sort of experience as occurs in the satisfaction of any want or need. Neither is the recognition-element in itself anything different from that which attaches to a memory image.

There is, however, a combination of recognition and satisfaction which is peculiar to the fulfilment of a purpose idea. When I meet

a friend whom I have not thought of for years I may recognize him and be glad to see him; but the attitude is different from that which I experience in meeting a friend whom I have been endeavoring to find for some special reason. In the latter case a peculiar feeling attaches to the fulfilment of the forethought. It attaches not so much to the perception as to the judgment of correspondence between forethought and realization. It is a judgment of relation with an affective tone attached. This judgment, in which the affective element is prominent, may be called the *sense of fitness*. The absence of fulfilment may in like manner be attended by an opposite feeling, which attaches to the judgment of dissimilarity between the forethought and the actual outcome. This is the *sense of unfitness*.

In simple acts the sense of fitness is seldom present. When I turn on the light I do not experience the feeling at all. But the sense of unfitness is apt to arise if the fulfilment is hindered, even when the act is simple. I turn the switch, but the light does not appear. The lack of correspondence between my forethought of the light and the actual outcome is accompanied by a distinct feeling of dissatisfaction. In this example the act is habitual. I think only of the light and not of my muscular contractions; the kinesthetic sensations of turning the switch follow the forethought, but the visual sensations pictured in the forethought are lacking. The absence of the anticipated visual sensations in the experience is the basis of the judgment. The feeling of unfitness is here associated with a certain portion of the experience, namely, the visual sensations which accompany the kinesthetic data.

The tendency of the sense of fitness and unfitness to appear in connection with both fulfilment and intermediate states is more noticeable in complex purposes. When I am in a strange room and think of turning on the light, the forethought is likely to be elaborated: I think of some of the intervening processes, such as walking to the center table or to the control switch near the door. Whichever action I perform first, if the result of this intermediate step is successful the final situation is apt to be accompanied by a sense of fitness—if unsuccessful it is accompanied by a sense of unfitness. In either case the judgment and feeling may attach to the act of finding (or failing to find) the switch, as well as to the outcome. When I start to read Professor X's latest book on Telepathy, I am immediately conscious of its unfitness to furnish me with any useful information on psychological problems. On the other hand upon taking up Professor Y's Psychology, I judge and feel at once its fitness to broaden my psychological outlook. The point to notice in these cases is that the feeling, whether of fitness or unfitness, may attach to an intermediate experience as well as to the fulfilment.

Further, it should be noted that the feeling attaches in every case to the *present* perceptual or ideal experiences—not to the forethought, which is already a thing of the past.

The most striking occurrence of the fitness and unfitness experience is in connection with subjective purposes, such as the solution of a mathematical problem. Take the example already mentioned: What is the next prime number above 47? Following the habitual numerical sequence my first thought is 48. That is even, and therefore unfit. 49? That is divisible by 7. 50 is a ten; 51 is divisible by 3; 52 is even. An even number is judged unfit immediately; the process is so rapid that it is sometimes mistaken for an intuition or a self-evident, *a priori* judgment. The discovery of divisibility by 3 is nearly as rapid; the digits 4 and 8 added together are obviously a multiple of 3. The division by seven is a longer process. What about 53? I divide it successively by 3, 7, 11, 13, 17, 19, and 23; all of these divisors are unfit; the next eligible factor is 29, which is more than half of 53. Hence I conclude that 53 is prime, and the sense of fitness arises with the solution of the problem. Another person might proceed by some other process, attempting, for instance, to divide 53 by 5 or 9, which I should consider useless; a third might refer at once to a memorized table of prime numbers, which in my own case is not available.

This example, however we set about to solve it, is typical of problem-working. The procedure is this: First, we set forth the problem; that is, we experience the forethought of the principal result. Next, we think in turn of certain associated steps, with each of which is connected the sense of fitness or unfitness. Finally, when a result is obtained in thought which tallies with the forethought, it is accompanied by a judgment of correspondence and a feeling of fitness.

The fitness experience is both a judgment and a feeling. The judgment, like all judgments, arises through association. If the experience corresponds to our memory of the forethought, the association produces a *judgment* of fitness. The accompanying *feeling* is due to the facilitation of reaction which this association brings about.

The judgment of unfitness occurs only when the forethought remains in consciousness (or is recalled) and becomes associated with a different act of sensations. If the act goes wrong, the perceptions attending the performance no longer tally with the forethought. When a memory of the forethought is associated with these disparate perceptions the association produces a judgment of unfitness. The resulting inhibition of reaction produces certain physiological modifications which serve as a basis for the feeling of unfitness. Irrelevant

acts are not associated with the forethought—they are not judged unfit and are therefore not inhibited. My morning bath is not germane to my pursuit of psychology—it is judged neither fit nor unfit to that end.

In subjective purposes the distinction between judgments of fitness and unfitness is not easy to account for. In mental problems the forethought does not represent the solution, but merely some characteristic of solution. How do we come to judge certain steps fit and others unfit? This problem hinges on the nature of rational thought.

Reasoning is a particular kind of association of ideas, more restricted than casual association. The succession of thoughts in a logical train corresponds so closely to the succession of processes in nature, that the conclusion tallies with reality time and time again;—in other words, “rational” thinking is a type which leads continually to fulfilment of the forethought, while chance associations may or may not lead to such fulfilment. This persistent correspondence tends to build up cumulatively, in connection with “rational” thinking, a judgment of fitness which we have no opportunity to build up in the ordinary hit-or-miss associations.

Compare the judgments $51 = 17 \times 3$ and $51 = 16 \times 4$. The latter is a random association and has no objective significance, whereas the rational association $51 = 17 \times 3$ means that 51 objects may be separated into 17 groups of 3 objects, or into 3 groups of 17 objects. To the adult this is so certain from past observations of nature that he does not actually stop to perform the operation. In intricate problems, such as the solution of a chess problem, one is more likely to spend time in “verifying the solution” by objective observation, to make sure that the association has been rational throughout.

When we form an association of the rational type the resulting ideas (conclusions) tally with nature. If, however, we happen to make a mistake, that is, form a non-rational association, we sooner or later come upon some unexpected inconsistency. In subjective purpose, so long as the associative process is rational or consistent, it is accompanied by a judgment of fitness. When we lapse into casual association we may still experience the same judgment of fitness; but as soon as an inconsistency appears the disparity transforms it into a judgment of unfitness. This occurs, for example, when we endeavor to separate our 51 objects into 16 groups of 4 each.

Our examination of the fitness factor indicates the following as its characteristics:

1. The sense of fitness or the sense of unfitness attaches to the

final outcome and to certain intermediate steps in purposive experiences, both objective and subjective.

2. The sense of fitness or unfitness does not appear in all purposive experiences. In simple purposes I assent to the forethought and the act proceeds to its fulfilment, usually with no judgment concerning the correspondence between forethought and outcome. It is only in complicated situations, or where attention is focused on the experience for the sake of psychological or ethical analysis, that the sense of fitness becomes explicit. To read it into all cases of purposive action is an instance of the psychologist's fallacy. Similarly, the sense of unfitness appears only when the fulfilment is impeded. But an implicit "fitness" or "unfitness" appears to characterize purposive experiences generally.

3. The fitness factor is psychologically distinct from the forethought. The characteristic mark of the forethought is its future reference, while the fitness-unfitness experience involves a sense of correspondence or disparity. It is not merely a judgment, but involves an hedonic element as well.

This completes our analysis of the purposive consciousness. So far as the present writer can discover no other mental data enter into the experience. Certain elements, which at first sight seem to present distinct characters, on closer examination reduce to one or other of the five factors already noted. In particular, the sense of choice, volition, or fiat is really nothing more than assent reinforced by the feeling of personal dynamic efficiency.

The distinctive feature of the purposive consciousness is thus seen to be an inversion of the usual temporal order of certain members in a series of experiences. In the purposive consciousness the idea precedes the perception, the general precedes the particular. The extent of this inversion is recognized in the judgment of fitness.

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(*To be continued.*)

REVIEWS AND ABSTRACTS OF LITERATURE

Art in Education and Life. HENRY DAVIES. Columbus, O.: R. G. Adams and Company. 1914. Pp. xii + 324.

The value of a book is obviously relative to the audience to which it is addressed. Dr. Davies tells us that his work is "intended for the general public, or that portion of it that is interested in the discussion of education, as well as for those actively engaged in education." For such

persons—teachers in the public schools and the active molders of public school policies—his book should prove of value. Partly a tract—his subtitle is “a plea for the more systematic culture of the sense of beauty,”—partly a manual of the resources and opportunities of the schools in the field of esthetic training, a general view of the whole subject is given which we should rejoice to see widely assimilated. The chapters on “the Esthetic Resources of the Schools,” “Methods of Developing Taste,” and “the Educational Value of the Drama,” contain much that is pedagogically good. But along with this good there is not a little that bears the countenance of perversity. For example, such a statement as that “the grammatical and prosodical study of language should never be based on literary works,” would naturally suggest the question, What under the skies is such study to be based on? And when we are told that by it “the taste is likely to be vitiated for what is beautiful,” we can only wonder what can be Dr. Davies’s conception of a “literary work” and its function. Nor are we reassured in regard to his theories of taste by his own literary practise. It may seem unreasonable to expect a more than common literary excellence in a work on esthetics, though the reviewer must confess to such an expectation,—in the case of Dr. Davies grievously disappointed; wordiness of the most laborious type is his obsessing quality. But it is to be assumed that the readers to whom Dr. Davies’s book is addressed will possess native powers of discrimination.

H. B. ALEXANDER.

UNIVERSITY OF NEBRASKA.

A Class-Room Logic. GEORGE HASTINGS MCNAIR. Nyack, New York: The Ethlas Press. 1914. Pp. vii + 500.

This new text-book in logic, like a great many others, finds its chief justification in the fact that a teacher of logic is likely to find his own book better suited to his needs than that of any other author.

The present book is definite, clear, and formally systematic in the extreme. It is very complete as regards the topics in deductive logic. The paragraphing and the typography are such that no student who can keep his mind on the matter can fail to see the relation of topics, and if he should fail, the outline, the summary, and the review questions at the close of each chapter would make his ultimate escape impossible. The problems for original thought and investigation which close each chapter are frequently helpful and suggestive.

Only three chapters of the twenty-one deal with inductive logic and scientific methods. The last two chapters have to do with logic in the class-room and logic and life. Throughout the book there are many suggestions for practical applications which should be of use to teachers in the schools. The author is a member of the staff of the City Training School for Teachers in Jamaica, New York.

ADAM LEROY JONES.

COLUMBIA UNIVERSITY.

JOURNALS AND NEW BOOKS

LA CIENCIA TOMISTA. August, 1915. *¿Porqué hay tan pocos contemplativos?* (pp. 337-362): J. G. ARINTERO.—The number of mystics is decreasing every day because we lack the two essential qualities of Christian abnegation and perseverance. *La homogeneidad de la doctrina católica* (pp. 363-387): F. MARTÍN-SOLÁ.—There is progress or development in Catholic theology; but this development is homogeneous with regard to its matter or objectivity, because it is deduced from revealed truth by means of a reasoning of real identity. *La enseñanza de Santo Tomás en la Compañía de Jesús durante el primer siglo de su existencia* (pp. 388-408): V. B. DE HEREDIA.—The following of St. Thomas's doctrine was made a precept by the founders of the Jesuit order. Their successors, however, did not imitate them; and, by the publication of the "Ratio Studiorum" gave a fatal blow to the authority of St. Thomas in the Society. *Boletín de Cosmología. Boletín de Ética. Bibliografía.*

Givler, R. C. The "Conscious Cross-Section." Seattle: University of Washington Press. 1915. Pp. vi + 412.

Hess, Herbert W. Productive Advertising. Philadelphia and London: J. B. Lippincott Company. 1915. Pp. xv + 358.

NOTES AND NEWS

"THE FitzPatrick lectures recently delivered by Dr. W. H. R. Rivers before the Royal Society of Physicians dealt with the relations between medicine, magic, and religion. Magic he defined to be a group of processes in which man used rites which depended on his own power, or on powers believed to be inherent in, or the attributes of, certain objects and processes which were used in these rites. Religion, on the contrary, dealt with processes dependent on a higher power, whose intervention was sought by rites of supplication or propitiation. But the savage mind distinguishes with difficulty between these two groups of ideas. Savage philosophy attributes disease to human agency, to some spiritual being, or to what we ordinarily call natural causes. He dwelt on the important part played by suggestion in the causation of disease among the Papuans and Melanesians, and he remarked that from the physiological point of view the difference between their rude methods and our medicine was not one of kind, but only of degree. They practised an art of medicine in some respects more rational than our own, for diagnosis and treatment followed more directly their ideas of causation. There were examples of leechcraft, such as the use of bleeding and massage in New Guinea, which did not follow a system so strictly logical and consistent. This led to another set of problems, the transformation of medical beliefs and practises as a result of contact and blending of peoples."—*Nature*.

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

A STUDY OF PURPOSE. II

PURPOSIVE ACTIVITY IN ORGANISMS

IN the first paper we examined the nature of purposive consciousness. We shall now consider purpose as a biological phenomenon.

Certain acts of living creatures serve as a preparation for future situations; that is, an act may be determined or conditioned by some subsequent situation in much the same way as ordinary events are "causally" determined by preceding situations. For example, when I pause in reading at twilight to switch on the electric light, the act of turning the switch is in a measure conditioned by the ensuing illumination and by the fact that I subsequently renew my reading, though it is also causally determined by antecedent physiological circumstances. In the same way the actions which a dog performs while pursuing a rabbit are in a measure conditioned by the subsequent act of catching and eating his prey as well as by the antecedent stimuli—visual and olfactory.

Objections may be raised to the use of such terms as *conditioned* and *determined* in this connection. They seem to imply that the future situation forces or compels the act which precedes it—an interpretation of the relationship which will scarcely be admitted. Yet the scientist frequently describes the causal relation in these very terms. We say that a cause determines or conditions its effect, but we do not mean that it uses some overpowering force in the process. It is in fact an anthropomorphic interpretation of natural phenomena to conceive of the antecedent terms in a causal series as exerting compulsion upon subsequent events. The transformation of a quantity of hydrogen and a quantity of oxygen into water is due to their nature and to circumstances in the environment. The scientist does not picture some compelling force or entity directing the activity of the H and O atoms, putting them together, or threatening them with dire consequences unless they unite; in short, he does not believe that they are "forced" to undergo the change. Some writers, it is true, speak of "laws" as determining occurrences; but this interpretation is a case of the cart pushing the horse, for the "law"

is merely a generalized description of repeatedly observed facts. We formulate a law on the basis of observation; it is scarcely scientific to say that the law determines or compels the particular event.

What the scientist understands by an event conditioning or determining another, then, is not compulsion from without or within; he means simply that the former event, uniformly and in the nature of things leads to the latter, as shown by repeated observation. An "effect" is the observed aftermath of the "cause": we have every reason to believe that event *A* will be followed by event *B*; that in the nature of things the two belong in sequence. If we use the terms *condition* and *determine* in studying causal relations, they imply no more than a general temporal relation of *before* and *after*. The same is true of purposive relations.

In purposive acts the temporal order noted in causation in some way becomes inverted. The dog certainly does not eat the rabbit before he catches it. Nevertheless, the act of eating is begun before the appropriate food stimulus appears. The later act (eating) is a condition of the various acts of pursuit and capture which precede it. In such a series of acts the present "hangs upon" the future, or is "determined by" it. The relation of terms in such a series is radically different from that in the ordinary causal series, the distinctive feature being a partial inversion of temporal order.¹ This temporal inversion is just the sort of phenomenon which was noticed as the distinguishing mark of the purposive consciousness. We may, therefore, properly extend the notion of *purpose* to include the type of behavior characterized by anticipation.

When we scan the field of biological phenomena we are struck by the overwhelming number of events which may be classed as pur-

¹ It should be understood once for all that this "inversion of temporal order" is not a reversal of the "flow of time," or any other mystical paradox. I mean merely that certain events which usually occur in the order A, B, C, D, come to occur in the order A, C, B, D. In such cases we may say that C anticipates B.

A philosophical colleague objects to the illustrations given in Part I, insisting that the B and the C are not the same in the purposive consciousness as in the memory consciousness. I admit freely that no event whatsoever is twice repeated. Scientific generalizations rest on *similar* transformations of *similar* data, not on *identity* of terms.

A biological colleague, whose criticisms of this part of the paper have been most helpful, objects to the notion of inverted order in biological events. He interprets life and phylogeny as a series of *cycles*. The notion of a "life-cycle" is useful as a figurative description; but it is not exact—none of these "cycles" is completed. On the other hand, we do find countless examples of "anticipation" in both behavior and growth processes. The concept of anticipation gives a biological meaning to the physicochemical transformations that occur in the organism.

positive. First of all, acts which are acquired as the result of repetition—so-called habits and intelligent acts—belong in this category. When the raccoon has learned to thread the maze, his act of traversing the passages and reaching the food-box is conditioned by his subsequent act of seizing the food.

Similarly, instinctive acts exhibit a purposive character when viewed as complete biological series. The nest-building activity of birds, the mating proclivities of all sexually differentiated creatures, the food-getting reactions of medusae—all such functions appear to be conditioned in part by the future outcome. Nest-building is partly conditioned by the eggs which afterwards occupy the nest; mating by the offspring which develop after fertilization; food reactions by the metabolic changes which follow the reception of food.

Finally, the phenomena of individual growth and phylogeny may be included in the list of purposive events. The various stages of cell-cleavage and development in the embryo are conditioned by the full-grown individual which finally appears, as well as by the physiological and morphological conditions in the fertilized egg. Individual variations are conditioned by the "varieties" and new species to which they give rise.

There are two sharply distinct modes of interpreting all these purposive activities, the *mechanistic* and the *vitalistic*. The mechanists believe that all modes of activity, organic and inorganic, are ultimately identical—that all may be formulated in the same general terms. The simplest modes of activity known to us are the physical and the chemical. Hence, the ideal of the mechanist in biology at present is to express all the activities of organisms in "physico-chemical" terms. Biochemistry and physiology have advanced far in this direction, though for some biologists purposive activity remains an insuperable obstacle to the complete acceptance of the mechanistic standpoint.

The vitalists, on the other hand, assert that a physicochemical description is inadequate to account for organic growth if not for behavior in general. They assert that a non-mechanistic factor, an "entelechy," is needed in order to explain the peculiar inversion of the causal time-order which we discover in purposive phenomena.

Now it may or may not be true that such a factor is present; but its existence is certainly not to be assumed *a priori*. Indeed, if entelechy is viewed as something which vitiates the orderly sequence of chemical and physical processes, the scientist will regard it as an admissible assumption only after the inadequacy of the mechanistic interpretation is made clear. According to the norm of parsimony, if a mechanistic process will serve as well as entelechy to explain any type of activity, it is preferable to the latter interpretation. The

movements of the planets may be explained equally well by the relations of gravity or by the controlling guidance of mysterious spirits; we accept the former interpretation in accordance with Occam's principle of parsimony. Similarly, if it can be shown that the purposiveness which is manifest in the evolution of species, in individual development, in instinctive activity, and in intelligent actions can be explained as well on mechanistic grounds as by the controlling guidance of entelechy, it would seem preferable to adopt the former viewpoint.

It remains to be seen whether the mechanistic interpretation is *adequate* to account for the purposive character of behavior and growth. The question is ultimately one of fact. But our interpretation of facts is often influenced by fundamental presuppositions. Thus the vitalists' attitude is determined largely by an uncritical conception of purpose. They carry over into biology a certain psychological datum, "directive potency," which appears from our earlier analysis to be an unessential factor in purpose. They tend to picture this entelechy as an intelligence, merely because in consciousness anticipation is experienced in the form of a thought.

The present study assumes the mechanistic standpoint as a working basis, though it admits the possible need of mending this view in the light of further evidence. We shall reject the implication of "potency" in the purposive sequence unless it be definitely demonstrated. We shall not admit the "conscious" character of biological anticipation in the absence of proof. The concept of purpose in the biological sphere is founded primarily upon an observed type of fact—a certain inversion of the usual temporal order of events. The precise cause of this inversion is a problem for scientific investigation.

Our analysis of purposive consciousness disclosed five factors: (1) A forethought of some future occurrence; (2) an attitude of assent; (3) a feeling of potency in the thought-process; that is, a belief that the thought has power to produce the foreseen result; (4) an associated self-notion; (5) a sense of the fitness or unfitness of the outcome or of certain intermediate steps. How far does purposive behavior include factors corresponding to these?

1. **ANTICIPATION.**—The fundamental factor in purposive consciousness is the forethought. In purposive activity the corresponding factor is preparation, or anticipation of a future situation. We have already alluded to the wide prevalence of anticipation in the organic world. It is found in all the higher types of behavior, instinctive as well as intelligent. Even tropisms exhibit it. It appears in the phenomena of growth, both individual and phylogenetic. Let us first examine the *nature* of anticipation in these various types of activity. We shall then be in a position to discuss the *mechanism* of

anticipation, and the *genesis* of anticipatory events in the organic world.

(1) *Nature of Intelligent Reactions.*—When I see a ball coming toward me and raise my hands to catch it, the reaction to contact is prepared in advance of the contact stimulus. The visual stimulus from the approaching ball initiates a set of movements which form a reaction to the contact stimulus that follows. When a raccoon is placed in a familiar maze and starts to traverse it, his locomotor adjustments are in part a reaction to the subsequent taste stimuli of the food lying at the far end. These are typical examples of reactions acquired by practise. The anticipation consists in an act which is begun in advance of a certain stimulus of taste or touch, but which refers to the future occurrence of such a stimulus. It is the biological analogue of the forethought, whether forethought or consciousness of the coming event be actually present or not.

Instinctive Reactions.—Anticipation of the coming situation is found in many reflexes and instinctive responses. Take a case very low in the scale of organic life. A medusa is stimulated by juices, emanating from food particles near by, which permeate the water. Acting on this chemical stimulus, the creature moves its tentacles to and fro, and thus prepares to gather in the nutritious substance. The reaction is anticipatory in that it serves to bring the creature into contact with the food sooner than if such movement did not occur.

The anticipation of a future situation shown in this reaction of a medusa is typical of instinctive behavior generally. The feeding and reproductive instincts are all anticipatory. When a chicken pecks at a grain of corn it is starting the food-assimilating reaction before the food is touched. In the human infant the suckling act involves a chain of reflexes,—seeking the breast, grasping the nipple, sucking, swallowing. The biological meaning of these separate acts is not fully understood till we study the feeding behavior as a whole. The very first stage, seeking the breast, has reference to the final outcome, swallowing and digesting. So in the reproductive functions, the biological meaning of sexual union is found in the production of the young. All these forms of behavior are anticipatory; they are reactions to food, to offspring, before the stimulus is wholly present.

Growth Processes.—If the reproductive functions are anticipatory, the stages of growth in the embryo manifest even more clearly the same characteristics. The organs appear in rudimentary form, they gradually shape themselves, till at length they attain the size and form of the corresponding organs in the parents. To study embryonic development as a mere causal succession of chemical reactions is not sufficient. Its biological meaning is dependent on the outcome.

So too in the functions of regulation and regeneration the significance of the process lies in the result. Healing is a reaction to the restored structure; it has a different biological significance from loss of blood when an artery is severed; this depends merely on the antecedent wound. The autonomic regulation of bodily heat is a reaction to the higher or lower temperature which will result—not merely to the antecedent fluctuations.

The metabolic changes involved in nutrition and general maintenance anticipate the subsequent condition of the creature in the same way. All the vital functions, in fact, are anticipatory; they prepare the organism for future conditions.

Phylogenesis.—The evolution of new species shows a similar anticipatory character. Variations assist in the maintenance of the phyletic chain—biologically speaking they are reactions to the future of the species. Hence, the differences which occur from generation to generation and between individual and individual are not merely causal, but anticipatory. They are adaptations to the future condition of the species or generic group. The reproductive functions may also be interpreted in a phylogenetic way. They are reactions to the future of the species, as well as to the future individual.

(2) *Mechanism of Anticipatory Behavior.*—The presence of anticipation in behavior and growth is evident. It is one of the phenomena which science is called upon to investigate. For the function of science is to study all observable relations. If we consider not merely detached facts, but series of events in nature, the relation of future events to the present is as much a problem for scientific investigation as the relation of past to present.

This does not imply that the purposive relation *supplants* causation. It is possible that if the anticipatory acts of behavior and growth were traced through from start to finish, each would be shown to be fully determined by its antecedents according to known physicochemical processes. One science or scientific viewpoint usually serves to *supplement* another; it does not contradict or supersede it. When a drowning man cries for help, the physiological antecedents of his vocal cries may be completely determined in a causal way by his past history; yet the significance of the act lies partly in the future. The purposive relation “overlies” the causal relation.

The vitalists assume that the causal succession is in some way altered by the phenomenon of anticipation—that the natural course of physical motion and chemical transformation is modified, directed, by the future outcome. The mechanists believe, on the other hand, that the physicochemical processes which constitute anticipatory reactions are of themselves adequate to account for the inversion of temporal order.

Two types of organic mechanism in animals serve especially to bring about anticipatory movements. These are the reflex mechanisms of the distant-receptors² and the central coordinating system. Both of these mechanisms are physicochemical structures. So far as observation goes they function in a physicochemical manner.

The distant-receptors are organs capable of being stimulated by more or less distant objects. The different types vary greatly in this respect. The eye is stimulated by waves generated by objects which are often at very great distances; the visual reaction may occur long before the object itself could reach the creature. The physical vibrations which serve as auditory stimuli have a more limited range. The emanations which serve as olfactory stimuli have still greater limitations and their velocity is so low that the object from which they originate may under favorable conditions arrive at nearly the same time. If we examine a creature's reactions to a given object, we note that some of these reactions occur earlier than others, depending among other circumstances upon the type of receptor stimulated. In the case of the flying ball my reaction to the visual stimulus precedes my reaction to the contact; in the medusa's behavior toward food the response to chemical stimulation precedes the response to contact-plus-chemical. The sequence of stimulation and response is fairly constant; but the lapse of time between the starting of stimulatory impulses from an object and the beginning of the response varies according to the character of the stimulus.

The central nervous mechanism serves to unite the various stimuli as well as to coordinate the response. In a plastic nervous system new combinations of stimuli lead to new responses, and repetitions of these combinations strengthen the mode of responses so obtained. The after-effect of past stimulation which is called "mnemonic" is due to the persistence of nervous paths or dispositions. One effect of this persistence is that a portion of the stimulus may initiate a reaction which on former occasions was started by the entire stimulus group. Thus a reaction which was formerly due to a succession of visual and contact stimuli, may come to be initiated by the visual stimulus alone when that stimulus occurs first. For example, when the flying ball is, say, fifty feet away, a reaction is started similar to that which was formerly brought about by the entire series of visual and contact stimuli. Thus I begin to respond not merely to the present visual stimulus, but to the future visual and contact stimuli. The raccoon in the familiar maze responds not only to the present visual, kinesthetic, and tactual stimuli, but to the coming gustatory

² This term seems preferable to the usual expression, "distance-receptors." The receptor is affected by stimuli from *distant* objects; it is not always differentially affected by the *distance*.

stimuli which formed part of the original stimulus-group. All intelligent anticipations are due to these central and distant-sense mechanisms.

It seems established that the elementary reflexes which enter into reactions of every type are purely physicochemical processes. Responses of the "intelligent" type are complex; they are characterized by a great number of alternative nerve-paths, of which the impulse follows now one, now another. According to mechanistic principles the nerve impulse always follows the line of least resistance. But the vitalist asserts that the path followed in intelligent reactions is determined not by the line of least resistance, but by a directing entelechy. In the present state of science surely the burden of proof rests upon his shoulders. It would be difficult in complex phenomena for the mechanist to demonstrate that *every single alteration* in behavior was due to a change in the neural tension. But he may very properly challenge the vitalist to demonstrate *any specific instance* in which the nervous impulse does not follow the path of least resistance. Till that is demonstrated we are justified in adopting the mechanistic interpretation of intelligent behavior as a working hypothesis.

In lower species, whose nervous systems lack plasticity, and in certain types of fixed reactions among higher species, the anticipatory mechanism is due to inherited structure. The succession of reflexes which form the suckling instinct in the human infant is not due to the persistent effects of past stimulation upon the nerve paths, but to the growth of neurones in certain directions and into certain mutual relations. The complex nest-building instinct and the simpler food-gathering reflex of the medusae depend similarly upon growth of structural mechanisms. Each reflex is a "machine" constructed by the growth process. Separately they may exhibit no more anticipatory character than the patellar reflex; but in their combination the first motor impulse serves as an anticipation of the final situation.

The structural mechanism which serves to bring about anticipatory behavior, both intelligent and instinctive, is thus in a measure the result of growth. We shall therefore turn to consider the anticipatory character of development and its mechanism.

The Mechanism of Growth.—The real crux of anticipatory activity appears to lie in the growth processes. According to Driesch, who has developed the vitalistic theory most systematically, the most conclusive objection to a mechanistic explanation of purposive phenomena is found in the processes of biological growth and repair. How, says Driesch in effect, can a mechanism provide for its own reconstitution? No machine known to us is able to construct another machine like itself, nor can it repair any of its own parts.

The function of reproducing new organisms by growth appears less formidable to the mechanist than the problem of repairing incidental injuries. The germ cell in its first stage of development divides into two; one of these cells after several subsequent divisions generates a germ cell, with all the functions of the original germ cell from which it is derived. The other derivative cells specialize; they undergo various transformations which determine the shape and position of the members and organs in the mature organism.

Just what chemical changes are involved in growth metabolism is a problem for the biochemist to discover. Our knowledge is still very incomplete; but enough is known already to indicate that the processes concerned in development are real chemical transformations of colloidal compounds. Is it not for the vitalist, then, to demonstrate that a directive agent is involved in addition to the chemical changes themselves—that growth can not be fully explained without such an agent? Is it not a more natural presumption that the growth process is strictly chemical and physical? Why should we assume a non-mechanical factor unless some crucial test has demonstrated that chemicophysical factors are insufficient to account for the process?

There is no question but that the animal organism is different from any type of machine so far devised by man. But it may yet prove to be a machine or mechanism of some type peculiar to itself. A locomotive is a very different sort of machine from a printing press, and a gasoline engine represents a different type of mechanism from either. There are machines and other machines; and our knowledge of mechanical possibilities is not yet complete.

The functions of repair and regeneration constitute, in Driesch's opinion, the most striking argument in favor of vitalism. He believes that they demonstrate conclusively the action of a directive agent. His experiments show that in certain lower organisms, even when more than one half of the body is destroyed, the creature is able to reconstitute the missing parts. Driesch found in the two-cell stage of the sea-urchin's egg, for example, that if one cell be removed the other cell will develop into a complete embryo of one half of the usual size; and that in the four-cell stage, if one cell be isolated, it develops into a complete embryo of very small size.³ In the blastula stage of the same species, if the blastula be cut with scissors in any direction, "each part so obtained will go on developing—provided it is not smaller than one quarter of the whole—and will form a complete larva of small size" (p. 11). No machine, Driesch argues, is "equipotential" in all its parts. "A machine is a specific arrangement of parts, and it does not remain what it was if you remove from it any portion you like" (p. 18).

³ "Problem of Individuality," page 10.

There are two objections to this line of argument :

1. Driesch's definition of a machine is determined quite arbitrarily. It is certainly *not* impossible to imagine a multiple machine, any part of which would function like the whole if the remainder were removed. Given a machine whose function is to construct a certain other machine, it is quite conceivable that if some portion of the constructed machine were destroyed the constructing machine would restore it. It is possible that the germ is such a constructing machine and the body such a constructed machine. Certainly the hypothesis of a vitalistic factor is not to be settled by a narrow and arbitrary definition of *machine*.

2. The actual facts of cell-cleavage do not lead necessarily to Driesch's conclusion in the tests which he describes. The process of mitosis demonstrates that the germ plasm possesses a double function; it produces germ cells and somatic cells. Now if the original cell possesses this double function, it is neither "unthinkable" nor "impossible" that cells resulting from later divisions should possess the same function also. Thus when one cell is removed in the two-cell stage, or part of the blastula is isolated at a later stage, the removal of the cell or cells which operate to modify the direction of growth may lead to a renewal of the original generating function in the cell or cells which remain. In other words, the germ cell is known to possess the generating function at the outset; quite possibly this function is not lost after cleavage, but is modified in each cell as multiplication proceeds, by the cells which surround it.

According to the mechanistic interpretation of the phenomena described by Driesch, the original "equipotentiality" of the cell is merely held in check by the activity of neighboring cells and by the specialization of certain cells in the growing organism. Regeneration occurs when the inhibitory factors are removed. We need not assume a "personal conductor" to direct the process of regeneration along its proper path; rather, the pathway opens up of itself through the removal of certain barriers.

Driesch's crucial test apparently reduces to a problem of what produces the *initial* division of the fertilized egg cell. Is this cleavage a physicochemical process, or can it be explained only by positing an indwelling entelechy? Here again we must await the verdict of the biochemist. But observations of crystal formation and other kindred phenomena are in line with a mechanistic explanation of mitosis. The scientist will therefore naturally assume the sufficiency of physicochemical processes as a working basis; it rests with the vitalist to demonstrate that the mechanistic explanation is inadequate to explain every step in the development and regeneration of organisms.

The Mechanism of Phylogeny.—The mechanism of phylogenetic anticipation is fundamentally the same as that of individual growth. The separation of an egg cell from the parent and its fertilization are the first stage in the growth of a new organism. Certain physico-chemical changes are observed in this process and the burden rests upon the vitalist to point out any additional entelechial agency.

But in phylogeny the anticipation reaches further into the future. Its "fulfilment" is the continuance of the species or line of individuals through countless generations. This involves both a mechanism for reproducing offspring similar to the parents and means for varying the offspring. A species which reproduced only exact replicas of the parents would manifest a static sort of phylogenetic anticipation. But as a matter of observation offspring are not exactly like the parents and their variations from parental type form the basis of phylogenetic evolution, which makes it possible for more species and more individuals to coexist. Hence, variation also is anticipatory, and we have to inquire what mechanism produces it.

The experimental and statistical study of breeding beginning with Mendel's work has already carried us a considerable way toward understanding both heredity and variation. So far as these results admit of generalization, reproduction is mechanistic in character. The investigations do not, however, indicate the existence of a mechanism for directing the line of variation toward the goal most favorable to the species. They do not show how anticipatory results have been reached.

(3) *Genesis of Anticipation.*—This brings us to the last stronghold of vitalism, the problem of the *ultimate genesis* of organic anticipations. The problem is twofold: (1) How comes it that anticipatory behavior mechanisms have actually been evolved—rather than mechanisms which do not refer to the future of the creature (or species) and do not yield beneficial reactions? (2) How comes it that growth and evolution themselves are anticipatory in character, as contrasted with the general purposelessness of inorganic activity? These two problems may be treated as one: Can the origin of anticipation in behavior and growth be explained under the mechanistic hypothesis, or does it imply the action of an entelechy?

Until Darwin's time the hypothesis of a creative or directive force seemed the only admissible explanation of the origin of different species, each with organs and functions adapted to its own particular environment. It was absurd to attribute to chance these countless devices for anticipating the needs of various creatures. To recall a pre-Darwinian illustration, how many trials must be made before the poem of *Paradise Lost* would be built up word for word, by drawing letters at random from a bag? In those days the burden of proof rested on the biological mechanist.

Darwin's greatest claim to fame lies in his discovery of a new scientific canon. Before his time the only alternatives for explaining progress were "design" and "chance." He pointed out an intermediate alternative in "natural selection." It is to be regretted that biologists have recently shown a tendency to minimize its importance. For while Darwin's description of the process may require revision, the canon itself underlies the whole structure of modern evolution. Without it we are thrown back on a magic of chance or a mystery of entelechy. Up to the present, at least, no biologist has discovered a substitute for "natural selection."

The concept of natural selection is too familiar to require any special discussion. Let us examine its bearing on anticipation. In the case of behavior our problem is to explain the origin of beneficial mechanisms, such as the distant-receptors and the central nervous system.

The rise of a distant-receptor through strictly physicochemical processes is quite comprehensible if we take into account the working of natural selection. If, through some chance variation, a peripheral organ appears in some creature, which is capable of being stimulated by the juices emanating from food, the creature possessing that variation is at an advantage over his fellows and is more likely to survive and have offspring than the rest of the species. A pigment spot which receives light stimulations is likewise an advantage, and so in higher species is the organ for receiving auditory impressions. Such variations therefore tend to "persist," while thousands of less favorable variations tend to "perish."

Just so the evolution of a central nervous mechanism is explicable through chance variation and natural selection. The creature in whom even a rudimentary nervous pathway has been formed, will perform his reactions more readily and precisely than his fellows in whom the afferent and efferent impulses must be diffused through the whole body substance.

In general, given a multitude of individuals in any species and given the possibility of variation in many directions, the creature whose variations give him an advantage over others is more likely to survive, so that his favorable variations persist. Purposive characters are favorable to life. It would seem probable, therefore, that the physical and chemical processes in organisms will tend to take on a purposive character whenever variation offers an opportunity, even without the special intervention of an entelechy.

So too in phylogeny. Whether the variations in the germ cells are minute or of a mutative character is a question for investigation; in any case we may presume that they originate mechanistically and not through a directive entelechy. But while species tend to vary in

many directions, only those new types tend to persist which in their general organization meet the conditions of the environment. The evolution of species *directs itself*; it prepares for the future environment by means of physicochemical processes.

Anticipatory activity of every sort, growth as well as behavior, thus appears to be explicable along mechanistic lines. (1) Organisms by means of chemical and mechanical processes tend to reduplicate themselves and at the same time to vary in countless directions. (2) The variations in structure tend to persist despite changes of substance. (3) Certain of these structures and their functions, by reason of the general uniformity of natural conditions, are especially useful for the life of the organism, while other acts and growth variations are useless or even harmful. Preeminent among the former are anticipatory acts and growth processes. (4) Natural selection results in weeding out those modes of behavior and lines of growth which are harmful to the organism, and in establishing those which possess a life value. This takes place through the survival of individuals whose variations in form and mechanism are in the main beneficial to their possessors. These principles, taken together, seem adequate to account for the presence of the anticipation factor in organic growth and behavior. It appears unnecessary to posit, in addition, a vital force.

2. FITNESS AND ADAPTATION.—The fitness-consciousness is associated with fulfilment of conscious purpose. The sense of *fitness* attaches to acts or thoughts which fulfil the forethought; the sense of *unfitness* attaches to those which do not tally with the situation pictured beforehand. Now, just as there is a well-marked biological analogue to forethought—namely, anticipation—so we find in behavior an analogue to the sense of fitness and unfitness. When the preparation-state of the muscles passes over into activity, if the reaction conform to that which is anticipated, the biologist and behaviorist consider the result a fulfilment of the anticipated act; if the action be checked or imperfectly formed, the result is an unfulfilled purposive act. The fulfilled act is termed *fit* in all its parts, while the non-conforming factors in the unfulfilled act are called *unfit*.

When we examine a complicated action, such as catching a ball, we find that a great number of simple muscular movements and adjustments enter into the total act. The arms are raised, the elbows flexed, the palms and fingers bent, the head and eyes directed toward the ball, etc. All these movements and tensions cooperate to produce the result of catching the ball. Each is *fit* or suitable to the total situation. If, however, the player loses his balance, if his arms are raised too late, if the hands are placed too far to one side, or if the eyes are *withdrawn* for an instant, the anticipated result fails.

Any movement or inhibition which mars the coordination of the total action is said to be unfit or unsuitable to the situation.

The genetic explanation of fulfilment presents no special difficulty. It may be accounted for in the same way as anticipation. The two are parts of one and the same continuous process. Past experience, persistence of nerve paths, and coordination of motor activities bring about both the muscular preparation and the action which follows. Through natural selection those coordinations which are most useful tend to survive and supplant less useful movements. Purposive actions, anticipated and fulfilled, tend to survive because of their special utility in the life of organisms.

But the completion of an act does not always mean fitness. In the sphere of behavior, especially, the concept of fitness offers some difficulty of interpretation. Every combination of muscular adjustments in a coordinated movement produces *some* result. If I slip and fail to catch the ball, I do not perform the act anticipated; but I do perform some other coordinated act. When I try in vain to recall a forgotten name, or when I endeavor to construct a laboratory device and fail, I live along in some fashion in spite of my failure. Even if I seek food in vain on a desert island and eventually die of starvation, I have fulfilled my life career such as it is, and the world moves merrily on without me. Is there any room in biology, then, for such a notion as unfitness? I believe there is.

Biological organisms may be regarded not merely from the physical and chemical point of view, but from a higher standpoint also. The living creature is a complex organization. The parts working together produce results which they would not yield separately. The growth from germ cell to adult creature means a succession of cooperative transformations. If a gross injury occurs or if the nourishment is insufficient, the usual growth processes are checked and the creature dies. The biological result is not attained, though the physicochemical transformations continue indefinitely. Hence, the biologist distinguishes between certain metabolic changes which prolong the life of a creature and certain others which reduce him to a lifeless congeries of atoms. The former changes are fit or appropriate from the biological standpoint; the latter are biologically unfit.

In the science of animal behavior a similar distinction holds. Certain muscular adjustments and movements produce results which maintain the normal life-processes—others result in a deviation from the normal. The former are classed as fit, the latter as unfit. In the lowest creatures the modes of behavior are relatively few. When a medusa moves its tentacles to and fro as the food approaches, this mode of activity serves to maintain the life processes; it is a "fit" mode of reaction.

As we ascend the scale of organic life the receptor and motor functions become more complex, and the modes of activity are more varied. When the dog snaps at an insect, the movement is deemed fit if it is adjusted to the conditions so that the insect is caught and swallowed; otherwise it is pronounced unfit. So with negative reactions. The act of the rabbit in running away from the dog is fit so long as it results in the rabbit's escape; if the act does not accomplish the anticipated result it is an unfit mode of behavior.

The behavior of man is most varied of all. His modes of maintaining life are complex and often very indirect. Katabolism and anabolism present intricate variations in the countless forms of human work and recreation. Foresight and forethought play an exceedingly important role in man's activity. Thus the switching on of the electric light, in the example given, is part of a long and intricate process in my life. My life-sustenance is conditioned by the fact that years ago I took steps toward a professional career in psychology; that I am now reading a work which will promote this career; that the act of reading depends upon light; and that at the present moment light is to be obtained by turning the switch. The present act is judged fit in so far as it promotes the whole life process.

The notion of fitness assumes a slightly different meaning in each of the evolutionary sciences. The behaviorist deals with more specialized processes than the biologist. He narrows the norm of fitness from mere growth and maintenance of life to special types of activity. For example, in the case of the dog snapping at an object, the behaviorist regards the act of snapping as fit, or appropriately accomplished, if the thing snapped at is caught, whether it prove to be a nutritious object, such as an insect, or an indigestible lump of earth. Fitness, according to the behaviorist, is the completion of a typical act, the performance of a specific set of movements from start to finish.

The psychologist narrows the meaning of fitness still further. The forethought is followed by a series of actions or thoughts. If the outcome corresponds to the forethought, the psychologist regards it as fit; or if the successive steps *up to a certain point* correspond to the progressive stages of fulfilment, he regards them as fit to this extent, whether they serve to prolong life or not.

The notion of fitness, then, is based upon one fundamental criterion: A later event is deemed fit if it conforms in some way to a preceding forethought or anticipatory situation; and this "conformity" is like that in the causal relation. In other words, the final step or any intermediate step in a purposive series is judged fit or appropriate when its functional relation to the first step is similar to that in a causal series, but with the time order of "initial" and "final" steps inverted.

The interpretation of *unfitness* is a corollary to this. In psychological purpose forethoughts may occur which, owing to one or more unfavorable circumstances, are not fulfilled beyond a certain point. In such cases the succeeding steps are all said to be unfit. When we pass to the biological sphere, the forethought is either absent or can not be identified by the observer. Hence, in the realm of behavior and growth the criterion of unfitness is altered. Any stage in a process of behavior or growth is deemed unfit when it does not conform to the typical purposive behavior or growth of the given species. In other words, if any coordinated activity of any species ordinarily fulfils the norm of fitness, then a deviation which leads to another outcome is called unfit so far as that particular norm is concerned.

A practical difficulty in determining fitness arises here. Since "forethought" is not in evidence in growth and behavior processes, our only criterion of their fitness is the harmony or lack of harmony between some initial stage of preparation and the result which follows. Now practically every creature differs from every other, and every individual act is slightly different from corresponding ones of the creature himself and his fellows. Yet these slight deviations do not always render the creature or the act unfit; on the contrary, we often consider the results more fit on account of these slight modifications.

This apparent inconsistency is due to our inveterate habit of considering activity as a fixed, determinate process. We are apt to forget that modes of behavior are evolutionary products. It is convenient to study an instinct or habit as a definite series of movements, conforming to a fixed type, just as we group together a lot of similar creatures and call them a species. But the concept of evolution leads to a modification of the static interpretation of species, and in just the same way we are driven to modify our static interpretation of action-types.

The purpose of any given action is a certain typical result. For example, the purpose of the sucking reaction in the human infant is to transport nutritious substances into the digestive system; the purpose of fertilization is to initiate the growth of a new individual. But from the evolutionary standpoint the *general* purpose of organic activity is to prolong the life of the individual or the existence of the race. The whole mass of biological functions, both reactive and developmental, are purposive, in the sense that they work toward this general outcome.

The concept of fitness is to be interpreted, then, in a broad evolutionary sense. An outcome which prolongs life is "fit." If an act differs from the average in such a way as to be more advantageous to the individual, it is judged to be "fitter" than the type. Fitness,

in short, is a judgment made by the scientist, and not a quality inherent in creatures and activities. The ultimate criterion of fitness in behavior is not the repetition of a stereotyped act; it is that the act in question leads to the prolongation of life. Similarly, the criterion of fitness in growth is that the process shall prolong the life of the organism or promote the continuance of the species.⁴ We have not merely two alternatives, fit and unfit, but a series of degrees in fitness.

Each variety of behavior (locomotion, grasping, swallowing, etc.) contributes something toward prolonging the creature's life; the life of the creature depends upon the cooperation of these functions. Thus one dog may be swifter of foot than another and catch the rabbit; but if his digestive organs are not so efficient as the other's, he obtains less nourishment from a given amount of food. The relative fitness of radically different types of behavior is difficult to determine, for they yield no specific result in common. But individual differences in the same function are comparable; swifter locomotion, keener visual discrimination represent higher degrees of fitness, in general, than slower speed and poorer vision.

It may assist our interpretation of purpose if we consider the relation of fitness to *adaptation* and *organization*. The term *adaptation* has been used in several different senses: it sometimes means a "modification" of type, it is sometimes synonymous with "fitness." The most fruitful conception seems to be a combination of these two. An adaptation is a modification of form, etc., which renders the outcome *more* fit. Thus we may regard a given action (*e. g.*, a certain dog pursuing a rabbit at a particular time) as *adapted* if it is modified from his previous mode of behavior in such a way as to accomplish the result more effectually. Yet we should not forget that the ultimate criterion is life-value. If the same dog is chasing a skunk, any modification which will *prevent* him from attaining the prey is an adaptation, since the capture entails disastrous consequences.

The notion of *organization* is to be interpreted in the same way. In general, the more highly organized a process, the fitter it is to accomplish the typical result. But at times a modification in the direction of simplicity proves fitter. Thus the adaptations of parasites in structure and functions are generally in the direction of greater simplicity. If we consider the course of biological evolution as one ever-continuing purposive process, we may say that in the main it tends towards greater complexity because more highly or-

⁴Spencer's phrase, "survival of the fittest," reverses this criterion. We measure the fitness of a creature to his environment by his capacity to survive. Spencer starts with an abstract quality of fitness and then argues that one who possesses it is more apt to survive.

ganized activities generally prove fitter. But complexity is not a "necessary" correlate of evolution. Purpose may work toward simplicity as well as toward complexity.

3. **ASSENT, POTENCY, SELF.**—In our analysis of purposive consciousness we found three other factors associated with the forethought: the attitude of assent, the feeling of potency in the forethought, and the notion of self. The feeling of potency was traced to kinesthetic sensations which accompany the purposive act, while the assent consciousness was found to be based on kinesthetic memories. The associated self-notion proved least characteristic of purpose; it arises only from the circumstance that purposive consciousness always involves personal activity and kinesthetic sensations. Have these three factors any significance in the objective study of behavior?

The self factor may be found in behavior generally and for the most part in growth. The anticipation and fulfilment characters of behavior are phenomena of the same individual organism. If by the self factor, then, we mean merely the fact that purposive reactions are carried out from start to finish by one and the same individual creature, we do recognize an objective factor analogous to the self-notion in conscious purpose. But if we go further and assume that there is a center of activity from which all purposive behavior is generated, there is nothing in the objective processes to justify the assumption. Just as we found that self-consciousness is not a universal characteristic of purposive experiences, that it is a late product of reflection, so the presence of a guiding self is not traceable in the process of anticipatory reactions.

As for the growth processes, they are concerned with the individual organism during every stage; but they involve assimilation of material from outside the organism and dissociation of waste products from the organism. The very beginning of growth involves the separation of a cell from the original organism to form another individual. Thus the anticipatory character of growth is not entirely a phenomenon of the individual organism.

When we examine the assent and potency data of purposive consciousness, we find it difficult to discover anything objective corresponding to them. Both of these data of consciousness rest on kinesthetic experiences. The memory of muscular contractions is an element in the state of consciousness which precedes purposive activity, as indicated by subjective report. In human behavior, therefore, an objective factor corresponding to assent may be assumed. The mental image is now generally admitted to have a physical basis in the disposition of cerebral structure. We may therefore conclude that anticipatory reaction in mankind is accompanied by stimulation

of kinesthetic traces in the brain centers. Whether any corresponding central antecedent is uniformly present in the behavior of lower creatures it is not easy to determine. Even in man we do not find an assent factor in consciousness accompanying the growth processes. On the whole, then, there is nothing in the data to justify us in concluding that *assent* is a characteristic mark of purpose.

The sense of potency in the forethought is a vivid factor in certain conscious purposive experiences. But it does not accompany simple purposive acts, and there is no consciousness of our power to grow or to heal ourselves. Hence, we may assume that the sense of potency is not characteristic of purposive phenomena.

All three of these factors, then, appear to be adventitious accompaniments of the forethought—not essential features of purposive consciousness. Regarded from the objective standpoint, the same conclusion is reached. Purposive behavior and growth do not depend on a guiding self, nor on a potent voluntary factor, nor on a special entelechial force. That even mechanistic biologists sometimes unwittingly use these terms may be attributed to the prominence of kinesthetic data in human experiences of activity. But these data, as we have seen, are merely accessory elements in the purposive consciousness. The assumption that a dynamic self plays an effective part in purposive activity is based entirely on unessential features which appear in the human consciousness of purpose. This anthropomorphic or rather *psychomorphic* interpretation of teleology has served to cloud the problem of behavior by suggesting certain complicated hypotheses regarding a subconscious directive force.

It is worth while in this connection to call attention to the inveterate tendency of the human race to read kinesthetic elements into physical phenomena. Our usual conception of "physical force" is kinesthetic. Few of us can relinquish altogether the notion of a sensible accompaniment to force and energy. The physicist's concept of *force* and *energy* implies only a functional change of relations. But our actual sensible experiences of force and energy are kinesthetic. Hence the tendency to a psychomorphic interpretation of force. When one billiard ball strikes another we feel that a kinesthetic factor accompanies the impact—that one ball *compels* the other to move. But is not the mathematical formula of functional change a sufficient account of the event?

A similar psychomorphic tendency appears in our interpretation of space and time. When we observe the interrelated masses of matter which form the physical universe, we add in thought a psychomorphic construct called *space*, in which these masses and their constituent atoms or electrons are supposed to be "contained." So, too, when we observe objects changing their relations, we add in

thought a psychomorphic construct called *time*, in which these changes are supposed to occur.

It is in line with this general psychomorphic interpretation of physical events that we represent the kinesthetic accompaniment of thought as a dynamic factor capable of initiating new thoughts and acts in a manner independent of the well-known associative processes—that we add to the process of successive association the psychomorphic construct of *volition* or *entelechy*.

One further variation of this psychomorphic tendency should be noticed. It is often assumed that the fulfilment of a purpose is due to *intelligence*. If by intelligence we mean trial and error procedure, it is certainly true that intelligence is an important factor in attaining the end foreseen. But if we conceive of intelligence as an autonomic revealer of truth, our interpretation clashes with the actual succession of mental and physical phenomena as observed through scientific investigation.

Intelligence is a function of the plasticity of nervous structure which enables a great variety of associations to be formed. This plasticity may be accounted for genetically through variations in nervous structure which have survived on account of their value in the lives of organisms. In each individual, from among the many alternative associations which this nervous plasticity renders possible, those associations are established which best accord with the conditions of environment. In other words, the more intelligent or plastic a man is, the more his purposive thoughts are likely to be fulfilled. The fulfilment is not due to a directive agent within.

In a certain chess problem I “see” that the inevitable result is checkmate for black in five moves. A novice at the game will fail utterly to see this result. Now while I discover the outcome only after considerable study, a chess master sees the solution at a glance. The master rejects certain alternatives at once, and reaches the result of other alternatives instantly. But it is his experience that shortens the thought process, not a peculiar “insight.” He may “jump” to the conclusion—and so indeed might I, though with far less assurance. Even after long study I may overlook certain variations—and possibly the master himself may overlook one alternative and hand in a faulty solution. In every case an “oversight” is due to a failure to associate, just as the representation of the successful outcome is due to the formation of the requisite associations. The central nervous structure of the chess master, and his repeated practise in forming the chessboard associations, seem sufficient to account for his greater speed and accuracy in reaching the conclusion. Is it not redundant to assume a psychomorphic factor of intelligence, and attribute to it some mysterious efficiency in bringing about the result?

We conclude, then, that purpose is a real phenomenon of organic activity. There are acts which *anticipate* or prepare for future situations. The adequacy of this objective anticipation is expressed by the biologist in a judgment of *fitness*, the ultimate "end" or fulfillment being the prolongation of life or the maintenance of the organic series.

So far as science can determine at present the inversion of temporal order which marks purposive activity and growth can be explained mechanistically. The assumption of an entelechy is both gratuitous and contrary to the general evidence.

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(To be continued.)

REVIEWS AND ABSTRACTS OF LITERATURE

The Soul of America: A Constructive Essay in the Sociology of Religion.

STANTON COIT. New York: The Macmillan Company. 1914. Pp. 405.

This book, according to the author, is a definite prospectus for the development of the spiritual resources of America, a prospectus, the aim of which is to enlist the interest, the time, and the money of men and women in a specific plan of religious evolution. The religion of a people, Dr. Coit maintains, must be an expression of the people's life and it must be developed with specific and conscious reference to the actual spiritual and moral potencies of that people. This was preeminently true of all ancient religions, typically of the religion of the Hebrews. Modern nations are suffering from a failure to gather up and interpret in religious form the fine qualities of their national life. In the case of the Jews these qualities flowered out in their national religion. "My propositions," Dr. Coit says, "assume that it would be possible to develop almost infinitely the spiritual potencies of the nation by organizing them and lifting them into self-consciousness and that, when so developed, they would be able to sweep away rapidly and forever national defects and wrongs and causes of suffering and disease which now alarm every true statesman and patriot." Each modern nation, and specifically America, is as much the chosen people of the Lord as ancient Israel ever was. "Who dare suggest that America is merely an ordinary nation?" The need is that Americans shall realize this fact and act upon it in the development of a national religion rather than as now suffering their religious impulses to atrophy by allowing them no expression except in the forms of an age, long past.

In the support of this view, the author discusses most suggestively the cultural unity of America, insisting that the essence of the American spirit is not materialistic, but is rather a fine idealism which is ample basis for a national religion. America herself is "the living church of which every citizen, whether he will or not, is an active member." He may be a bad

member and the church itself may be far from perfection; but the fact that every citizen is spiritually dependent for his character and for his standards of manhood upon the psychic influence of his nation is undeniable." The stamp of the nation upon the character of the individual is always definite and unmistakable, far more so than that of any particular religious sect.

The essence of religion is in its social phases rather than in its individualistic or purely psychological phases, as has been assumed by Professor James and others. From this point of view religion must therefore be interpreted. After outlining his conception of a national church and pointing out that all religious phenomena are essentially social phenomena, the author proceeds to point out the meaning in terms of humanistic religion of the various traditional religious conflicts. He finds that all traditional concepts express definite values which the advocate of a humanistic religion should wish to preserve. God is defined as the indwelling moral genius of a people, the Holy Ghost has always been the socializing power that quickens individual men and women into glad self-sacrifice and service. His interpretation of such concepts as sin, devil, hell, redemption, salvation, eternal, infinite, prayer, etc., is most suggestive. The humanistic view of prayer is one of the most interesting sections of the book.

The last section of the book deals with the need of religious ritual and symbolism in humanistic as well as in traditional religion.

It is impossible in the space of a review to give a connected and complete account of this most stimulating interpretation of humanistic religion. As a piece of literature alone it ranks high because of the felicity of the style and the general human interest of the thought which it presents. The religious leader of even the orthodox type can not fail to be charmed and stimulated by this remarkable book.

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JOURNALS AND NEW BOOKS

THE PHILOSOPHICAL REVIEW. July, 1915. *The Existence of the World as a Problem* (pp. 357-370): JOHN DEWEY. - An examination of the problem of the existence of an external world as treated in Russell's "Our Knowledge of the External World as a Field for Scientific Method in Philosophy." The question can be asked only after it is surreptitiously answered. The solution of the problem consists "simply in making explicit the assumptions which have tacitly been made in stating the problem—subject to the conditions involved in failure to recognize that they have been made." *The Psychological Element* (pp. 371-385): GRACE A. DELAGUNA. - How shall the psychologist conceive his subject-matter if psychology is to be a natural science? "If there are such things as psychical complexes at all, they must be composed of elements, and these elements must be such things as are capable of forming com-

plexes, namely, *existents conceived after the analogy of physical entities*. If psychology is not willing to adopt this conception, it must give up the claim to be a natural science." *The Metaphysics of Nietzsche's Immoralism* (pp. 386-418): BERTRAM A. LANG. - No systematic effort has been made to state the metaphysics presupposed by Nietzsche's ethics. His position is a product of Schopenhauer and biology. Much is not new, but for his time the point of view characterized by biological pragmatism, and conceptions of organization, creation, freedom, optimism, and atheism was new and distinctive. Nietzsche may be supposed to defend instinct and spontaneity against the intellectualistic organization of the German state. *The Development of Berkeley's Ethical Theory* (pp. 418-430): G. A. JOHNSTON. - Berkeley's writings contain many anticipations of a theory of ethics. He was hampered at first by supposing that ethics would, like metaphysics, proceed from Locke. Berkeley should have been and might have been the first of the utilitarians. *Reviews of Books*: Bertrand Russell, *Our Knowledge of the External World as a Field for Scientific Method in Philosophy*: BERNARD BOSANQUET. *Annales de l'Institut superieur de Philosophie, Université de Louvain*. Tome III. Année 1914: ARCHIBALD A. BOWMAN. Woodbridge Riley, *American Thought*: H. B. ALEXANDER. *Notices of New Books. Summaries of Articles. Notes.*

THE PHILOSOPHICAL REVIEW. September 1915. *On Intolerables: A Study in the Logic of Valuation* (pp. 477-500): WILBUR M. URBAN. - As the inconceivability of the opposite has been the test of intellectual philosophy, so the intolerability of the opposite is made the test of "value" philosophy. Intolerables, both for sensibility and ultimately for will, exist. From the intolerability of its opposite as a principle, implications about reality are said to follow, chiefly that there is a necessary connection between reality and value, namely, that the essence of value is conservation. *Personality and the Suprapersonal* (pp. 501-525): R. M. MACIVER. - Setting out from the axiom that all values are values for "persons," maintains that there is a unified world of persons as a coherent system of ultimate values, criticizes false conceptions of this unity, reviews the facts of suprapersonal unity, and concludes that "these facts do reveal the reality and the nature of a coherent spiritual world, regarded as a whole of values." *Kant's Method of Composing the Critique of Pure Reason* (pp. 526-532): NORMAN KEMP SMITH. - Forms a portion of an introduction to a *Commentary to Kant's Critique of Pure Reason*. Emphasizes the inconsistencies, the mechanical construction, and the patchwork method of the *Critique*. *Discussion: Bertrand Russell on Neo-Realism* (pp. 533-537): MARY WHITON CALKINS. - Reviews Mr. Russell's papers published in the *Monist* for 1914-15. The writer wonders, in the light of admissions there made, that Mr. Russell remains a neo-realist, and also regards Mr. Russell's criticism of the non-realistic position as superficial. *Reviews of Books*: Theodore De Laguna, *Introduction to the Science of Ethics*: WARNER FITE. John Dewey, *German Philosophy and Politics*: FRANK THILLY. Bernardino Varisco, *Know Thyself*: G. W. CUNNINGHAM.

F. Pillon, *L'année philosophique*: R. A. TRANOFF. *Notices of New Books. Summaries of Articles. Notes.*

Aster, E. *Einführung in die Psychologie*. Leipzig und Berlin: Verlag von B. G. Teubner. 1915. Pp. iv + 119. 1.25 M.

Campagnac, E. T. *Studies Introductory to a Theory of Education*. Cambridge: University Press. 1915. Pp. ix + 133. 90 cents.

Conway, Sir Martin. *The Crowd in Peace and War*. London and New York: Longmans, Green, and Company. 1915. Pp. 332. \$1.75.

Frischeisen-Köhler, Max. *Thomas Hobbes. Grandzuge der Philosophie. Erster Teil, Lehre vom Körper*. Leipzig: Verlag von Felix Meiner. 1915. Pp. 210. 5 M.

Hasse, Karl Paul. *Marcilius Ficinus Ueber die Liebe oder Platons Gastmahl*. Leipzig: Verlag von Felix Meiner. 1914. Pp. viii + 259. 6 M.

Titchener, E. B. *A Beginner's Psychology*. New York: The Macmillan Company. 1915. Pp. xvi + 362.

NOTES AND NEWS

JOINT COMMITTEE ON STANDARDS FOR GRAPHIC PRESENTATION

PRELIMINARY REPORT PUBLISHED FOR THE PURPOSE OF INVITING SUGGESTIONS FOR THE BENEFIT OF THE COMMITTEE¹

As a result of invitations extended by the American Society of Mechanical Engineers a number of associations of national scope have appointed representatives on a Joint Committee on Standards for Graphic Presentation. Below are the names of the members of the committee and of the associations which have cooperated in its formation.

WILLARD C. BRINTON, *Chairman*, American Society of Mechanical Engineers. [7 East 42d Street, New York City.]

LEONARD P. AYRES, *Secretary*, American Statistical Association. [130 East 22d Street, New York City.]

N. A. CARLE, American Institute of Electrical Engineers.

ROBERT E. CHADDOCK, American Association for the Advancement of Science.

FREDERICK A. CLEVELAND, American Academy of Political and Social Science.

H. E. CRAMPTON, American Genetic Association.

WALTER S. GIFFORD, American Economic Association.

J. ARTHUR HARRIS, American Society of Naturalists.

H. E. HAWKES, American Mathematical Society.

JOSEPH A. HILL, United States Census Bureau.

¹ Copies may be had from The American Society of Mechanical Engineers, 29 West 39th St., New York: 5 cents to members; 10 cents to non-members. Discount in quantities.

HENRY D. HUBBARD, United States Bureau of Standards.

ROBERT H. MONTGOMERY, American Association of Public Accountants.

HENRY H. NORRIS, Society for the Promotion of Engineering Education.

ALEXANDER SMITH, American Chemical Society.

JUDD STEWART, American Institute of Mining Engineers.

WENDALL M. STRONG, Actuarial Society of America.

EDWARD L. THORNDIKE, American Psychological Association.

The committee is making a study of the methods used in different fields of endeavor for presenting statistical and quantitative data in graphic form. As civilization advances there is being brought to the attention of the average individual a constantly increasing volume of comparative figures and general data of a scientific, technical, and statistical nature. The graphic method permits the presentation of such figures and data with a great saving of time and also with more clearness than would otherwise be obtained. If simple and convenient standards can be found and made generally known, there will be possible a more universal use of graphic methods with a consequent gain to mankind because of the greater speed and accuracy with which complex information may be imparted and interpreted.

THE FOLLOWING ARE SUGGESTIONS WHICH THE COMMITTEE HAS THUS FAR CONSIDERED AS REPRESENTING THE MORE GENERALLY APPLICABLE PRINCIPLES OF ELEMENTARY GRAPHIC PRESENTATION

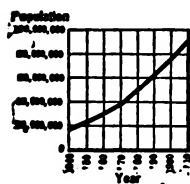


Fig. 1

1. The general arrangement of a diagram should proceed from left to right.



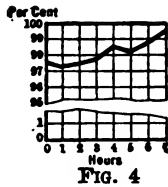
Fig. 2

2. Where possible represent quantities by linear magnitudes as areas or volumes are more likely to be misinterpreted.

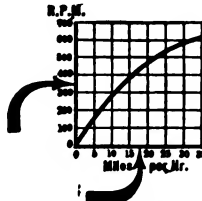
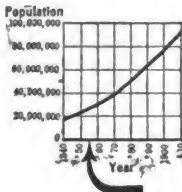


Fig. 3

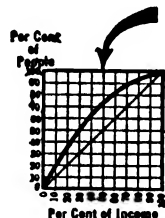
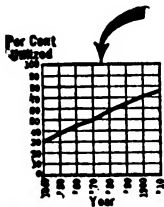
3. For a curve the vertical scale, whenever practicable, should be so selected that the zero line will appear on the diagram.



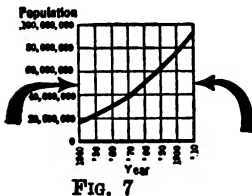
4. If the zero line of the vertical scale will not normally appear on the curve diagram the zero line should be shown by the use of a horizontal break in the diagram.



5. The zero lines of the scales for a curve should be sharply distinguished from the other coordinate lines.

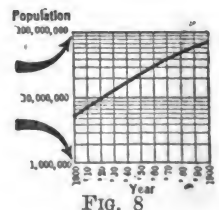


6. For curves having a scale representing percentages, it is usually desirable to emphasize in some distinctive way the 100 per cent. line or other line used as a basis of comparison.



7. When the scale of a diagram refers to dates, and the period represented is not a complete unit, it is better not to emphasize the first and last ordinates, since such a diagram does not represent the beginning or end of time.

8. When curves are drawn on logarithmic coordinates the limiting lines of the diagram should each be at some power of ten on the logarithmic scales.



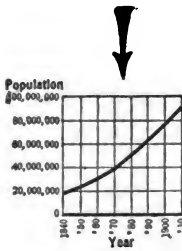


FIG. 9A

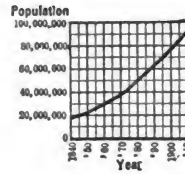


FIG. 9B

9. It is advisable not to show any more coordinate lines than necessary to guide the eye in reading the diagram.

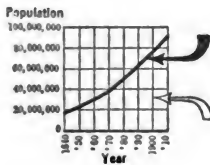


FIG. 10

10. The curve lines of a diagram should be sharply distinguished from the ruling.

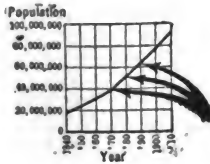


FIG. 11A

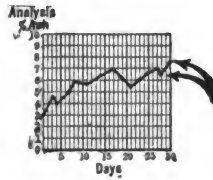


FIG. 11B

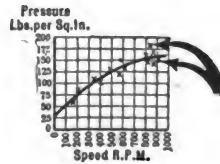


FIG. 11C

11. In curves representing a series of observations it is advisable, whenever possible, to indicate clearly on the diagram all the points representing the separate observations.

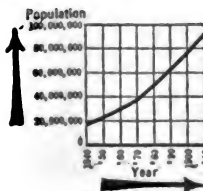


FIG. 12

12. The horizontal scale for curves should usually read from left to right and the vertical scale from bottom to top.

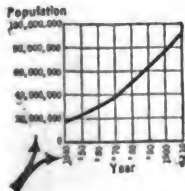


FIG. 13A

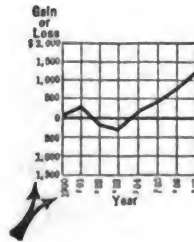


FIG. 13B

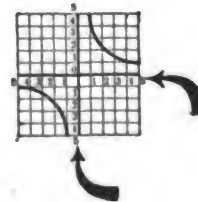


FIG. 13C

13. Figures for the scales of a diagram should be placed at the left and at the bottom or along the respective axes.

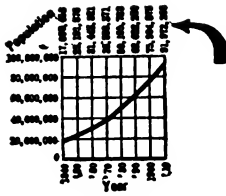


FIG. 14A



FIG. 14B

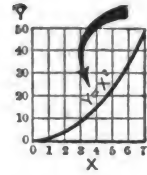
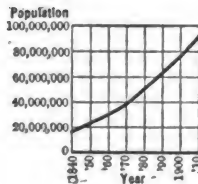


FIG. 14C

14. It is often desirable to include in the diagram the numerical data or formulæ represented.



Year	Population
1840	17,009,453
1850	23,191,876
1860	31,443,321
1870	38,558,371
1880	50,135,783
1890	62,622,250
1900	75,994,575
1910	91,972,268

FIG. 15

15. If numerical data are not included in the diagram it is desirable to give the data in tabular form accompanying the diagram.

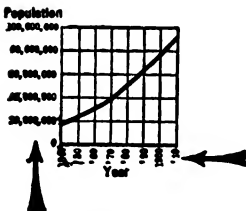


FIG. 16

16. All lettering and all figures on a diagram should be placed so as to be easily read from the base as the bottom or from the right-hand edge of the diagram as the bottom.

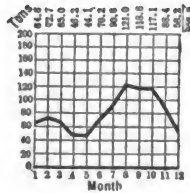


FIG. 17. ALUMINUM CASTINGS OUTPUT OF PLANT No. 2, BY MONTHS, 1914.
Output is given in short tons. Sales of scrap aluminum are not included.

17. The title of a diagram should be made as clear and complete as possible. Sub-titles or descriptions should be added if necessary to insure clearness.

THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY

AND

SCIENTIFIC METHODS

VOL. XIII. No. 3: FEBRUARY 3, 1916

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

A STUDY OF PURPOSE. III

THE RÔLE OF PURPOSE IN NATURE

WE have seen that the concept of purpose is based on a certain conscious experience. The distinctive feature of the purposive experience is that the usual order of sequence between presentation and representation is inverted. The ideational experience which forms the first stage of purpose is termed *forethought*; the progress and fulfilment of the purpose are accompanied by a feeling of *fitness*, or by a contrary feeling if the fulfilment is impeded.

Our study of objective purpose indicates the presence of corresponding factors in behavior and growth. The analogue of forethought is an *anticipatory reaction*; the analogue of the fitness-sense is a judgment by the observer: when the outcome conforms to the scientist's ideal he judges it *fit*, when it fails to tally with this ideal he deems it *unfit*. On the basis of this similarity we are justified in extending the notion of purpose to certain biological phenomena, in which an inversion of temporal order is observed.

It remains to consider whether the category of purpose may be carried over into the inorganic sphere. Do any transformations or motions of physical things (apart from those pertaining to biological organisms) anticipate the future? This in turn suggests a still more fundamental question: Does science find any substantial indications that the constructive make-up of nature as a whole is purposive and that the succession of events in cosmic history constitutes a purposive series?

The scientist's problem is this: So far as we know at present the constitution of nature is quite empirical. It might have been quite different in many respects. The chemical elements might have been different, or the existing quantity of each might have been more or less than it actually is. The physical laws might have been different, or the grouping of masses into worlds and the material composition of these worlds might have been otherwise. If all physical nature is empirical, we may ask, (1) Does the actual constitution of nature give

evidence of a purposive *origin*? In other words, may we conclude on scientific grounds that its actual formation was anticipatory of the stages which evolution has undergone and will undergo? (2) Does the *evolution* process itself furnish evidence of anticipation and purpose? The problem of origin seems to involve an entelechy, since the beginning of the physicochemical series, if there was such a beginning, could scarcely itself be expressed in mechanistic terms. The problem of evolution is merely a generalization of the biological problem. If cosmic evolution as a whole *should* prove to be purposive, the purposive relation involved might be either entelechial or mechanistic.

We find, then, three fairly distinct problems confronting us: (1) The existence of purpose in *inorganic processes* similar to that which clearly occurs in the organic realm. (2) The purposive *origin of the universe*. (3) The purposive character of *cosmic evolution* as a whole.

It may be well at the outset to justify the attempt to examine these problems from a purely scientific standpoint. For, owing to the absence of any very clear empirical evidence on the subject, scientists are generally inclined to avoid the teleological problem as applied to inorganic nature. Some investigators hold that the problem is insoluble—that the answer is really “unknowable.” Others insist that its solution transcends the bounds of scientific procedure and that an answer may only be obtained by non-scientific means, through the medium of philosophy and theology.

Neither of these seems the proper attitude for the scientist to take. (1) To hold that any phenomena are unknowable is distinctly unscientific. In many cases science has discovered new paths leading to the solution of seemingly insoluble problems. Spectral analysis revealed the chemical composition of distant stars, which had been assumed to be beyond the range of human knowledge. The most that the scientist may venture to say of any problem is that the answer is *unknown*. It is provincial if not paleolithic to declare any truth *unknowable*.

(2) To relegate the problem of teleology to philosophy and theology was a defensible attitude in pre-Darwinian times. There was then no scientific means of explaining the mechanism of purpose, whereas both of these branches claimed to possess a master-key to certain obscure problems of the universe. Now that biological science offers a definite explanation of purposive behavior, the relation of purpose to cosmic progress becomes an actual scientific problem. Whether or not the attempt prove successful in throwing new light on the trend of the universe, science seems called upon to investigate the problem of purpose to the very foundations according to its own methods.

Before beginning this study it would be well to recall once more the distinction between the mechanistic and vitalistic conceptions of purpose. The mechanist regards the purposive relation as *supplementing* the causal relation. Purposive phenomena, according to his view, are also causal phenomena. The succession of physicochemical processes in purpose is continuous, just as it is in pure causation. There is merely an *additional* relation between certain terms, which is the inverse of causal antecedence and consequence.

The vitalist, on the other hand, regards the purposive relation as *counteracting* or *superseding* the causal relation. According to his view there are in purposive phenomena one or more "uncaused" terms. Either the future in some way changes the present; or else some agency outside the series of events exerts a guiding influence upon their succession, so that events take a different course from that brought about by physical causation. The latter interpretation I understand to be Driesch's position. The supposed guiding agent, entelechy, may be part and parcel of the "material substance" or intimately associated with it; but one of its distinctive features is that it lies "outside the causal series."

It is somewhat difficult for a mind trained in the study of physical and chemical relations to picture such an entelechy or to understand the nature of its activity. But inasmuch as some earnest and well-trained observers do accept it, the hypothesis deserves serious consideration by scientific thinkers. Its validity should be determined by *evidence*, not by the test of *conceivability*. It is not sufficient to waive entelechy aside on the ground of inconceivability; for certain inconceivable hypotheses have ultimately worked their way into general scientific acceptance.¹

The chief stumbling-block to the mechanistic interpretation of mental and biological purpose has been the potent, *directive* factor. We found reason to believe that this is only a psychomorphic adjunct to purpose. In the organic realm the mechanistic view, which rejects this factor, seems to be supported by the weight of evidence. The issue between vitalism and mechanism in the inorganic world should likewise be determined according to scientific evidence.

1. *Purpose in the Inorganic Processes.*—Our first problem is to determine whether any inorganic transformation gives evidence of possessing a purposive character. We shall base our inquiry upon the two distinctive factors discovered in purposive behavior, *anticipation* and *fitness*, and begin with an examination of the former.

(a) *Anticipation.*—Do inorganic activities in any way anticipate the future? Do they ever prepare for or refer to later situations?

¹ One leading aim of these papers is to urge a serious consideration of the entelechy hypothesis and its rejection on the evidence.

Physical events in general constitute an irreversible series—or, more exactly, a “non-reversing” succession. The motion of a material body tends to continue in the same direction indefinitely. When a moving body is deflected by some force or obstacle, it seldom retraces its course in precisely the opposite direction. When a mass of earth or rock disintegrates, its particles scatter far and wide and never return to reconstitute the original mass.

Certain physical phenomena indeed are *rhythmic*; this is particularly the case with simple motions, such as light and sound waves or the swing of a pendulum. The tides furnish an example of a rhythmic series on an unusually large scale. Closer examination, however, demonstrates that tidal rhythm is not a perfect reversal of events; winds and reefs often alter the course of the flow and transform tidal action into a succession of progressive changes. The same is true of the simpler rhythmic motions. Friction, atmospheric disturbances, and other influences modify sound vibrations and pendular movement.

Instances of *simple reversal* occur in the transformations of bodies from one state to another and in chemical activity. Water is transformed into steam or ice, and these bodies may return again to the liquid state. Chemical compounds are formed, and under certain conditions the compounds are transformed back into their elements. But the reversal seldom brings about an exact reconstitution of the original situation in every particular. Some of the ice evaporates before the rest is transformed into water. Part of the chemical compound unites with some other substance to form a new compound before the remainder has been resolved back into its elements.

A *cyclic* form of motion occurs in certain physical phenomena, such as the revolution and rotation of planets. But here, too, the recurrence of phases is imperfect. The rotation of the earth is subject to constant alterations; the earth's orbit is forever contracting. The more closely we examine nature, the less evidence do we discover of any complete reversal of serial order, or any exact cyclic repetition of events in the inorganic sphere. The general pattern of physical change appears to be a progressive, non-reversing series of transformations.

So far from raising an initial presumption against the teleological hypothesis, however, this general irreversibility of physical events is quite consistent with a purposive interpretation. For the reversal of events which characterizes purpose is not a complete retracing of the process step by step in the opposite direction. Anticipation is only an inversion of the order of *certain events* in the series. In the ordinary causal sequence represented by A, B, C, D . . . L, M, N, O, the event B is the usual antecedent of L, M, N, O. In purposive activity

certain of these events, M, N, come to be antecedents of B; the series becomes A, M, N, B, C, D . . . L, O. When the medusa, acting upon an olfactory stimulus (A), begins its food-getting reactions (M, N) before the food is grasped (B), this reversal of order stamps the act as purposive.

Are there indications of such anticipations in the inorganic world? Do we find any chemical or physical activities which begin before their antecedent conditions are completely established? Up to the present I have been unable to discover, outside of the organic sphere, any *unquestionable* example of anticipation. In popular language the sun "struggles" to pierce the clouds and pour its warm rays on the earth. Even were all the sun's rays concentrated on the earth, instead of an infinitesimal portion, it would be difficult to discern anything anticipatory in the "act."

The relation between clouds and rivers furnishes a less fanciful example. The sun's heat evaporates water from the sea, the temperature cools and precipitates rain, which gathers in springs and streams and passes at length into the great rivers. The formation of clouds, then, is in a way an anticipation of the river's flow. It serves to maintain the streams at a fairly constant level.

We may cite also the successive formation of strata in the earth's crust by precipitation of lime, basalt, and other substances. The older teleology would interpret the stages in the process as "means" to an "end,"—namely, the production of the solid earth. But does it involve real anticipation? Does not the causal relation describe it fully? In such cases does the future outcome add any new meaning to the successive stages of the process?

Certain mechanical devices of human origin manifest anticipation. The governor on a wheel keeps the speed constant. If the wheel begins to rotate faster the weight flies out and checks it; if the wheel slackens the weight is lowered and the diminished friction causes the speed to increase. There is no doubt but that the presence of the governor anticipates the irregularities of the wheel's motion. In certain motor engines immediately after combustion a valve opens through which the waste products pass out. The opening of the valve is anticipatory to the discharge.

Numerous examples of this sort might be mentioned, but they are scarcely relevant here, since they all originate in the activities of human organisms. They do serve, however, to demonstrate one fact,—namely, that mechanistic processes *may* fall into the purposive type. One would scarcely attribute a resident entelechy to the regulator. On the other hand, in all these cases the purposive type of activity is built up through the interaction of organisms with these inorganic bodies. The inorganic bodies do not of themselves assume

the purposive type of activity. Clerk-Maxwell suggested that a guiding "demon" might enable heat to pass from a colder to a warmer body; but he pointed out at the same time that the heat activity does not of itself accomplish this reversal.

In living matter we find abundant instances of anticipation, as already indicated. It should be noticed also that in the course of evolution, taken as a whole, so-called intermediate forms appear—rudimentary organs and transitional species,—which seem explicable only through references to other forms which appear later. Anticipation is so marked a characteristic of biological phenomena, that the most mechanistically inclined biologist finds it difficult to dispense altogether with teleological language in discussing growth and behavior. On the other hand, when we study the "behavior" of chemical elements, the evolution of the stellar universe, and the formation of the earth's crust, it is difficult to discover a single indisputable instance of anticipatory activity. Does this indicate that anticipation is a phenomenon which belongs exclusively to biological organization?

I am not sure that so sweeping a conclusion is justified. (1) The anticipatory behavior of organisms depends on complex structure. Outside of the organic realm we have little opportunity to observe very complex colloidal compounds. If anticipatory activity depends upon *complexity* (and upon *organization* in the broad sense of orderly complexity), is there any but negative evidence to warrant us in limiting the sphere of anticipation to *biological* organization, *i. e.*, to the orderly complexity of carbon compounds?

(2) It appears from observation of organisms that the greater the degree of organization, the further-reaching and more detailed is the anticipation. This in itself would lead us to expect only rare and crude instances, if any, among simple inorganic phenomena.

(3) The example of the mechanical governor would seem to refute the assumption; for a crude speed regulator might conceivably come into existence by some fortuitous combination of substances. A natural dam may approximate a type of water-gauge.² The complex interworking of cloud-formation and river-flow may also serve as an argument for anticipation in the inorganic sphere. One single exception destroys the generalization.

(b) *Fitness*.—In the activity of organisms the fitness factor is a judgment by the observer that the outcome of the activity conforms to a type or to a general ideal. The dog's food-getting reaction is fit when it results in his capturing and devouring the prey. Or, in the

² These two illustrations were suggested by Professor R. S. Lillie's reference to the safety-valve in his admirable paper on "Purposive and Intelligent Behavior" (this JOURNAL, XII, page 604). The first two parts of the present paper were completed and the third part outlined before the writer was acquainted with Professor Lillie's article.

broader aspect, it is fit when it serves to maintain the dog's life. From this broader viewpoint we would not judge the devouring act to be fit if the prey devoured is poisonous.

The physical sciences proceed on the assumption of uniformity. So far as conditions are the same the mechanical activity is exactly the same; and so far as they differ the activity does not conform to the assumed type—it is not “fit” in that sense. We are accustomed in experimental work to solve the question of conformity by mathematical criteria. Take the problem of the atomic weight of hydrogen in relation to oxygen. Based on $O = 16$, a number of independent tests give values for H varying between 1.0075 and 1.0085. The investigator assumes the average or median as type, and estimates the relative fitness of the particular tests according as they approach this standard.

The criterion of fitness may be used to determine the purposiveness of an activity where its anticipatory character is in doubt. For example, take the sequence of evaporation from the sea and the flow of rivers. If we regard a certain height of water in the river as the type, then a given amount of evaporation and rainfall leads to a fit outcome. A greater or lesser amount of evaporation is to this extent unfit. But how are we to determine the “standard” height of water? In animal behavior we found difficulty in setting particular norms, for the reason that behavior different from the norm was sometimes judged fitter than that which conformed. In the river-level problem it is far more difficult to select a norm. Is the norm a steady level, or an average level with fluctuations, or a progressive lowering of level as the stream cuts its way deeper into the bed? If the river breaks its banks and floods a marsh-land, is this outcome fitter or more unfit? It is difficult in studying such activities to form any solid judgment of fitness with reference to a particular norm.

How is it with general norms or ideals? The ultimate criterion of fitness in the organic sphere proved to be the maintenance of the individual life or the persistence of the phyletic chain. The nearest approach to this among inorganic phenomena is the maintenance of an object's form despite changes of substance. Thus a river maintains itself, although the water is constantly replaced by other water. There is a seductive analogy between this and the maintenance of organic life through all the creature's metabolic changes. If we consider the maintenance of water in river-beds as a general norm and the evaporation from the ocean as an anticipatory action, we may attach a judgment of greater or less fitness to the rainfall in wet and droughty seasons, respectively.

The scientific physiographer would probably adopt this interpretation. If physiography is a real science, it would seem possible to

extend the notion of purposive activity to such phenomena as these. We may even find in physiography examples of "adaptation"—that is, modifications which render the activity more fit.

A volcano builds itself up by means of its own activity. The lava which it throws out collects in a cone, while the continual passage of material from the inside keeps open a vent and maintains a funnel-shaped passage. This passage is lengthened more and more as the mountain grows higher. In the nature of the case more material flows to the base than collects at the summit, so that the sides of the volcano maintain a curved slope which forms a suitable incline for the flow of lava. The action at any moment is fit, but the modifications render it *more* fit. In other words, the activity "adapts" itself to each phase of the changing conditions.

Again, a river gradually wears away its bed. The swifter current in mid-stream makes that part deeper; the banks are cut down so as to give clearly marked limits to the channel. The general action of erosion is *anticipatory*, in that it prepares the river bed for the continued flow of the river. Each step in the erosive process is also an *adaptation*; it renders the river-bed more fit for the flow of the current.

Should activities of which the above are instances be included under the concept of purpose? From the physiographer's standpoint this extension of purpose is legitimate, for they bear the distinctive marks of purpose—anticipation and fitness. The biologist may object that the river and the volcano are not unitary things in the sense that organisms are units. But are not the cell and the organism also groups of particles from the physicist's standpoint and groups of atoms from the chemist's?

If biology has a right to adopt an arbitrary unit which suits its needs, can it refuse to recognize the right of another science to adopt the unit which *its* data justify? Each science is the best judge of its own requirements. The real question is whether physiography is a science—or rather, whether its data admit of scientific treatment. It would be difficult for the biologist to defend his own science against the physicist and at the same time combat the claims of physiography. I believe there is some ground, then, for extending the concept of fitness into the inorganic realm, though little progress has actually been made in this direction.

This extension, however, serves only to emphasize the mechanistic interpretation of purpose. For it is doubtful whether any scientific physiographer would seek to account for the process of river-maintenance and volcanic action by the directive agency of an entelechy.

We may conclude, then, that there are some few scientific indi-

cations of "purpose" in the inorganic realm, and that the evidence certainly precludes a sweeping denial of its *possibility* in that sphere. So far as the actual evidence goes, however, the indications favor the mechanistic interpretation rather than the vitalistic.

2. *Purposive Origin of the Cosmos*.—So far we have considered only specific types of inorganic activity. Quite a different problem arises when we examine the character of the *ultimate data* which compose the inorganic world. Do the make-up of atoms and electrons, their spatial relations and "forces," their modes of composition, their actual distribution, etc., indicate a preexisting "plan"? We have only the later terms of the series to go upon. If an anticipation stage existed, we have not observed it. I see no way of studying this phase of purpose from the standpoint of *anticipation*; our only avenue of approach, apparently, is from the side of *fitness*.

The question of *entelechy* stands on quite a different footing in the explanation of origins from its place in the explanation of changes. In the latter it seems to be wholly discredited. In the problem of origins, however, the issue between entelechy and mechanism is still open so far as our present survey is concerned. Even though there be no directive potency in consciousness or in organisms, a directive factor may prove requisite to account for the beginning of the things which are.

Certain writers have recently endeavored to reinstate the earlier cosmic teleology, and to demonstrate that the actual constitution of the universe is peculiarly harmonious, a conclusion which seems to indicate a preconceived design. For example, the existing range of temperature on the earth is favorable to rainfall, which produces the streams, which cause erosion, which renders the soil favorable for vegetation. Similarly they conclude that initial prevision is evidenced by the great abundance of those elements which are most important for the preservation of life. In each of these instances, as in almost all that are brought forward to sustain the contention, there is some reference to life. But the purpose here considered is not a biological act—it is rather the fitness of inorganic conditions to produce and maintain vital organization. Such examples of the peculiar fitness of inorganic conditions might be multiplied. Several writers have traced them out in great detail.³

There is, however, a fundamental scientific objection to this mode

³ See especially the recent work by L. J. Henderson on "The Fitness of the Environment." Professor Henderson holds that the cosmic process is strictly mechanistic, but that there may be a tendency which works "parallel with mechanism without interfering with it" (p. 306)—this tendency being located "at the very origin of things, just before mechanism begins to act" (p. 308). It is interesting to note that Professor Henderson assigns teleology to a realm outside the domain of science (p. 311).

of reasoning. Admitting that inorganic conditions are peculiarly suitable to the maintenance of life as actually constituted, it may nevertheless be argued that under a different set of inorganic conditions a different type of organism might have arisen for which those alternative conditions would have proved just as favorable. It is not reasonable to infer design from the fitness of present conditions, unless at the same time we can show that any other conditions would have resulted in hopeless chaos. At present there are no means of demonstrating this. On the contrary we do find certain inorganic phenomena, such as the properties of silicon compounds, which suggest that on a planet where carbon was scarce a different type of organism might well have arisen based upon some other element.

The attempt to infer design from the peculiar fitness of actual physicochemical conditions rests mainly upon enumeration of particulars. In the interest of fairness the evidence for the other side should be presented. Unfortunately no one has undertaken, so far as I am aware, to enumerate systematically the points of *unfitness* which inhere in the actual constitution of matter, its properties, and its relations.⁴ It is not easy for us to imagine a universe of other sorts of atoms with other properties and relations. The scientist may concede his own inability to picture things as they might be, without being at all convinced that they might not be different, and that the constitution of such hypothetical things might not be better fitted to secure an harmoniously working universe. In short, the arguments so far advanced for "peculiar fitness" lead merely to the meaningless conclusion that the fitness of things is what it is.

The attempt to read purpose into origins by such arguments as this is merely an extension of the vitalistic conception of purpose from the biological sphere to the problem of cosmic origins. At any given instant (it is argued) the position of events would "naturally" be so-and-so; but at certain critical moments entelechy steps in as a directing force and alters the "natural" sequence of phenomena. So too it is assumed that at the origin of things their constitution might have been this, that, or the other; an entelechy steps in and directs what they shall be. We have seen, however, that there is no empirical ground for the belief that at any instant a directing force alters the mechanistic course of events. Why then should the scientist carry this discredited notion over into the sphere of origins, about which he knows far less?

⁴ According to all indications, in the actual physical universe the dissipation of energy will ultimately reduce any given world to a cold, solid mass, on which life as we know it will cease to exist. Surely this is a supremely *unfit* character in the constitution of things!

The philosopher will obtain scant hearing among scientists if, after conceding the mechanistic character of biological events, he attempts to smuggle entelechy in at the beginning of things. A notion accepted in one sphere may be carried over by analogy into another with some plausibility. But if it afterward prove false in the former sphere, one should demand independent evidence if it is to stand in the latter. If the action of a directing agency during the *course* of events is unsupported by evidence, there is no *a priori* ground for assuring such a directive agency at the *beginning* of events.

The present findings of science, however, indicate rather a world without beginning in time. If the succession of physical changes has proceeded from all time, there is surely no question of a directive agency at the beginning. The scientist will not go so far as to assert the *impossibility* or *inconceivability* of a beginning, or of an entelechy in that beginning. He will merely note the entire absence at present of evidence to support the hypothesis.

3. *Purpose in Cosmic Evolution.*—It remains for us to consider the relation of purpose to the progress of events in the universe taken as a whole—or rather in that fragment of time and space open to modern scientific observation. The notion of evolution in its broadest aspects covers the growth of stellar systems, the integration of single worlds like the earth, the chain of living species, and social organization. This dynamic concept is to-day firmly established in science. It points to a progressive change, rather than an ebb and flow of events—to new stages of organization and novel results attained in the course of history. The evolution concept *per se* involves nothing which may not be stated in purely causal terms. But the occurrence of anticipation and prevision in certain portions of the general system is definitely established. Can this notion of purpose be extended to the course of cosmic history regarded as a single interwoven plexus of events?

So far as the *vitalistic* interpretation of purpose is concerned, it is difficult to find any warrant for such an assumption. The facts in biology on which the notion of a directive entelechy are based have been shown to lend themselves readily to a mechanistic explanation. Inorganic phenomena require even less the support of an entelechial hypothesis. Natural selection seems an adequate substitute for prevision in the interpretation of organic evolution, and we find nothing in the processes of inorganic evolution which indicates the action of a directive force outside of the causal chain. Scientific evidence, then, leads clearly to the rejection of the entelechial assumption in interpreting the course of cosmic evolution.

There remains, however, the possibility of extending the *mechan-*

istic interpretation of purpose to the cosmic process. We have endeavored in these papers to work out a scientific conception of purpose which avoids the implication of a potent, directive agency. Purpose in the last scientific analysis implies only anticipation and fitness. Do we find evidence of these factors in the cosmic process as a whole?

The mechanistic standpoint is an attempt to explain organic phenomena in physicochemical terms. In so far as this attempt is successful, the gap between inorganic and organic processes is bridged. When, therefore, the mechanist comes to consider the rôle of purpose in the universe, his fundamental assumption makes it feasible for him to group the organic with the inorganic. That is to say, the mechanist finds no ground for setting organic phenomena off by themselves. He regards the entire course of evolution as a single graduated process.

The only scientific basis, in our present state of knowledge, for the extension of the category of purpose to the course of cosmic evolution seems to be the general orderly interweaving of natural processes in their mutual interplay, and their progress toward a pre-conceivable goal. The physical universe, even apart from organic life, is a cosmos, not a chaos. The uniformity of nature, the prevalence of the same chemical and physical "laws" throughout the vast extent of space and time which are within scientific observation, the conservation of energy, the wide reach of light, gravity, etc.,—all these empirical generalizations testify to a general unity of composition and unity of action in nature. There is present something more than fitness—there is evidence of *harmony* of all processes.

Science can not infer with certainty that this general harmony implies *anticipation*. But there is apparently a certain *trend of events* which may be noted even with our present limited knowledge. With the further advance of knowledge it seems likely that the direction of this trend will become more clearly evident. In other words, it seems possible that the fulfilment of the cosmic process may be anticipated or foreseen in human knowledge.

Unfortunately this type of prevision does not meet the conditions of purpose according to the mechanistic interpretation. For the anticipation of events implied in mental and biological purpose is a temporal inversion *in the series of events themselves*, not in a separate thought-series. Our thoughts, or their physical bases, form part of a world-wide causal sequence, it is true, but they constitute only a minute portion of the vast complex sequence which embraces the whole course of cosmic evolution. Without insisting too dogmatically on the parity between antecedent and consequent, we may nevertheless hesitate to call any individual man's knowledge a "prep-

aration" for the vast future course of the world's evolutionary progress. The successive steps in the general cosmic evolution, according to all present scientific knowledge, do *not* anticipate future steps, in the sense of preparing for them. Whether an extension of knowledge will reveal any such preparatory or anticipatory action in the process itself, it is beyond the province of this study to suggest.

In the absence of direct evidence for *anticipation*, we can only point to a substitute conception, *trend*. There does appear to be a general trend of events toward more complex organization, better adaptation, and moral improvement. What we know of stellar evolution points to a trend in the direction of complexity and harmonious organization. The evidence from the organic world is far more significant. The trend of organic evolution appears to be a steady advance; the later forms are more complex, fitter, better, than the earlier. Despite the "struggle for existence" there is a general cooperation of action among species—an interworking of the several processes of multiplication, destruction, and variation. The organic world is apparently working out its own destiny in a well-rounded manner.

The real value of this evidence it is difficult to estimate accurately. One is prone to attach undue weight to particular phases of evolution. The appearance of plant life on the earth, the rise of man, the defeat of a barbarian horde, impress the student of certain sciences as being crucial events. They do not seem especially significant, however, when we consider the aeons of time and the vast stretches of the stellar universe. The only conclusion of universal importance which science yields in this matter is that there is a general trend of cosmic evolution "upward."

To the exact scientist, as Bertrand Russell suggests,⁵ the evolution of biological forms seems trivial compared with the immutable laws of inorganic matter. The history of higher intelligence and social organization on one minute planet for some 10,000 solar years seems but a single tremor in the pulse of time. The conquests of Alexander or any other terrestrial event look small in perspective. On the other hand, from the standpoint of *values* the appearance on the scene of rational beings, capable of ethical judgments, seems to mark a tremendous leap in advance.

Allowing for the natural bias of both parties, I believe we may grant the existence of a "trend" of some sort in cosmic history, to which the judgment of "harmony" is attached. Harmony may be only a broader conception of *fitness*, but *trend* is not equivalent to anticipation or *preparation*. Unless the meaning of purpose be con-

⁵ "Our Knowledge of the External World as a Field for Scientific Method in Philosophy," pages 11 ff.

siderably revised, it does not seem applicable to the general course of cosmic events.

It is one thing to quibble over terms, and quite another matter to attach clear and definite meanings to the terms which are employed. We have endeavored to attach a definite scientific meaning to the vague popular notion of purpose. Our analysis fixed upon the "reversal of sequences" as the fundamental characteristic of scientific teleology, the adequacy of the inversion being estimated in the judgment of fitness. The notion of a *trend* appears to be somewhat different from this. It would only becloud the issue to include it under the idea of purpose. For this reason, while we may conclude, on the basis of empirical evidence, that "history" in its widest sense shows a *trend*, our present scientific knowledge does not indicate that it manifests a *purpose*. Whether scientific investigation will ultimately succeed in discovering a teleological character in cosmic evolution, is for the future to determine. We should reserve judgment till crucial evidence is at hand.

Up to the present, science has discovered only meager data for the extension of the purpose category below the organic realm. While the concept proves extremely useful in biology and psychology, the causal category is the all-important mode of interpreting inorganic phenomena. Philosophy and primitive science, starting as usual at the wrong end of the series, have read the higher into the lower. They have overestimated the importance of purpose in cosmic events, just as they have overestimated the importance of the kinesthetic factors in purpose itself. The voluntaristic philosophy of Schopenhauer and Nietzsche, the entelechial philosophy of Driesch, are but exaggerated instances of this widespread tendency.

Mechanistic science finds a place for teleology in the world. But the purpose which mechanistic scientists recognize is not the *entelechy* of the vitalist; it is a principle of transformation which co-operates with causation, not an efficient agent which plays havoc with causal transformation.

SUMMARY

Our study of purpose covers three separate fields: the conscious experience, the "objective" biological phenomenon, and the rôle of purpose in the general scheme of nature. We considered the psychological problem first, since the notion of purpose is found to be based on a certain conscious experience.

1. *Purposive Consciousness*.—The distinctive feature of the purposive experience is the inversion of the usual time order of certain events. Representation precedes presentation, the general precedes the particular.

Our analysis of the purposive consciousness brought to light five factors. (1) *Forethought*, the most characteristic factor, is an idea or image which carries with it a reference to the future. (2) *Assent*, which attaches to every forethought, is based on certain kinesthetic memories. (3) *Potency-feeling*, the feeling of an efficient force in the forethought, is based on the kinesthetic sensations which accompany muscular tension in movement. (4) The *self-notion*, or personal reference in purposive acts, is based upon the kinesthetic data which attend all personal activity. (5) The *sense of fitness* accompanies the fulfilment of the forethought and certain intermediate steps; it is a judgment that the experience corresponds to the forethought. Its opposite form, the sense of unfitness, is a judgment of non-correspondence. This factor, like the first, is very characteristic of purposive experiences.

The three kinesthetic data—assent, potency-feeling, and self-notion—are incidental accompaniments. They have all acquired undue importance in the psychological analysis of purpose. In particular, the overestimation of the potency-feeling is responsible for the common theory that the forethought has power to effect its own fulfilment by an autonomic selection and guidance of events. It has led to unscientific and mystical interpretations of volition, which closer analysis fails to justify. The fiat is only assent reinforced by a feeling of dynamic efficiency.

2. *Purposive Activity*.—Our study of purposive activity in organisms included both behavior and growth. Purposive activity as observed in organisms is characterized by only two of the factors noticed in the conscious experience—*anticipation* or preparation, and *fitness* or adaptation.

(1) *Anticipation* is a real biological phenomenon. Behavior and growth are actually conditioned by the future as well as by the past. A later event is the basis of some earlier event, not merely its effect. That is, the usual temporal order of events observed in ordinary causal sequences is partly reversed in purposive activity. The embryo's growth has reference to the future adult state; a responsive act may begin before the situation to which it is a response is fully present.

Anticipatory behavior depends upon a set of mechanisms, especially the distant-receptors and the central nervous system. The phylogenetic acquisition of these mechanisms and their functions by organisms is sufficiently accounted for historically by chance variations and natural selection, since anticipation is generally beneficial to the creature.

(2) *Fitness*, the second factor, is not so much an observed phenomenon as a judgment by the observer. Scientists judge the fulfil-

ment of a purposive act by its correspondence with a type. In the final analysis a reaction or growth process is judged "fit" if it tends to prolong the individual's life or to preserve the species. An act or process which tends to end the creature's life or destroy the species is deemed "unfit." Between these extremes we find a graduated scale of fitness.

(3) The other factors which occur as accessories in the conscious experience of purpose have no counterpart in purposive activity. There is nothing in behavior or growth corresponding to the consciousness of "assent," "self," or "dynamic potency." Nevertheless these factors, particularly the sense of power in consciousness, have greatly influenced the scientific interpretation of purposive activity. They are largely responsible for the psychomorphic view of instinct and intelligence which characterized the earlier biology. The vitalist's entelechy is, in fact, an impersonation of these psychomorphic factors.

The extension of such notions as volition, indeterminism, and compulsion to the sphere of biological processes in the form of a guiding entelechy seems an assumption unwarranted by present evidence. The whole sequence of events in growth and behavior appears capable of explanation in mechanistic terms.

3. *Purpose in Nature.*—The rôle of purpose in the cosmos is a legitimate problem for science to face. (1) In the *inorganic sphere* there is no clear evidence of anticipation—that is, preparation—though a few facts, notably among physiographical processes, seem to indicate its presence. To these processes the judgment of fitness may be attached.

(2) When we consider the *origin* of the cosmos, the older purposive interpretation, founded upon entelechy, finds no support. For the entelechy theory rests upon a biological and psychological analogy, and scientific evidence in these two spheres is against the assumption on which the analogy rests. Entelechy, regarded as a potent, guiding agency, appears to be merely a psychomorphic element added to the notion of purpose. Without entelechy the very problem of origins vanishes, for science finds no other ground for assuming a beginning in the chain of natural events.

(3) Finally, if we seek for evidences of purpose in the general scheme of *cosmic history*, we find indications of a *trend*, but not of *purpose*. Science so far has observed no clear signs of anticipation in the general course of evolution, but only of a tendency toward greater complexity and harmonious interworking. What the future will discover remains to be seen. Present indications at least would lead us to judge that purpose is not a fundamental category in the scientific explanation of cosmic evolution. HOWARD C. WARREN.

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SOCIETIES

THE TWENTY-FOURTH ANNUAL MEETING OF THE
AMERICAN PSYCHOLOGICAL ASSOCIATION

THE twenty-fourth annual meeting of the American Psychological Association was held in Chicago on December 28, 29, 30, at the University of Chicago. About one hundred were registered as in attendance and a somewhat larger number were present at the annual banquet and the president's address. Among the special features, in addition to the programme of papers, were the discussion of the relation of psychology, philosophy, science, and pedagogy in the academic curriculum; the report of the committee on the status of psychology in normal schools; the unusually full and well-arranged apparatus exhibit, in charge of Professor H. A. Carr; the address of the president, Professor John B. Watson; the annual dinner and smoker; the luncheon at Hull House, as the guests of Dr. William Healy; the visit to the Detention Home of the Cook County Juvenile Court; and the exceptional opportunities afforded for general sociability and acquaintance.

At the annual business meeting Professor Raymond Dodge was elected president of the association for the ensuing year, and Professors H. A. Carr and K. Dunlap were elected to the council. The various committees reported their activities during the year, and several administrative items, of interest only to members of the association, were considered. The committees on psychology and medicine and on prizes were discharged. The committee on the academic status of psychology reported a study of the teaching of psychology in normal schools. This report, prepared by Professors Margaret Washburn and Bird T. Baldwin, has been printed in full and copies were distributed at the business session. Professor Yerkes gave a brief account of the San Francisco meeting. Steps were taken to reduce the number of papers placed on future programmes and Professors Bentley, Whipple, and Ogden were appointed as programme committee. A committee on terminology was arranged for. Nineteen new members were elected.

The following resolution, presented by Professor Whipple, was adopted by the association:

WHEREAS, psychological diagnosis requires thorough technical training in all phases of mental testing, thorough acquaintance with the facts of mental development, and with the various degrees of mental retardation;

AND WHEREAS, there is evident a tendency to appoint for this work persons whose training in clinical psychology and acquaintance with genetic and educational psychology are inadequate;

Be it resolved, that this association discourages the use of mental tests for practical psychological diagnosis by individuals psychologically unqualified for this work.

The association was invited to hold its next meeting at Columbia University, and this invitation was accepted. It is intended at this meeting to celebrate the twenty-fifth anniversary of the association by appropriate special programme features.

At the apparatus exhibit were demonstrated an exposure apparatus (C. L. Hull), a chronoscope (K. Dunlap), a constructive ability test (T. L. Kelley), a recorder for tapping and a portable tachistoscope and memory apparatus (H. S. Langfeld), a new learning apparatus (W. H. Pyle), two spatial relations tests and a learning test (W. V. Bingham), peg form boards (J. E. W. Wallin), multiple choice apparatus (R. M. Yerkes), various instruments and charts (M. Bentley), and a class-room stop-watch (G. M. Whipple). C. E. Stoelting Company had on display numerous psychological instruments and materials and demonstrated many of these. J. F. Shepard exhibited blue prints of the new psychological laboratory at the University of Michigan and gave a detailed description of the plans.

The programme of papers comprised some seventy reports, with considerable informal discussion. Nearly one third of the papers were on the standardization and results of mental tests and their use in clinical, educational, and vocational psychology.

J. W. Hayes reported comparisons of the Binet scale, the Yerkes point scale, various selected tests, and school grading. R. M. Yerkes and C. Rossy reported progress on the formulation of a point scale for adolescents and adults, following the plan of the preadolescent point scale. R. Pintner has begun preliminary work on the construction of a scale of performance tests for deaf mutes and those with imperfect language. T. L. Kelley presented a constructive ability test, in which the manipulation of building blocks affords indications of various important traits in terms which admit of objective grading. W. H. Pyle, using a new device for testing learning capacity, finds that colored children studied have three fourths to four fifths the learning capacity of white children. E. S. Jones gave a detailed account of the standardization of certain familiar test blanks. He also reported from the Vocation Bureau of Cincinnati numerous correlations of mental measurements among themselves, with school grade, physique, average weekly earnings, and job tenure. The results suggested that, under the present haphazard methods of placement, mental measurements furnish but little basis on which to forecast either earnings or permanency of position during the first two years in industry. W. D. Scott reported correlations of 50 to 90 per

cent. between the results of mental tests of adults and (1) firm ratings of these adults for efficiency and (2) the later achievements of the individuals in the field, suggesting the immediate applicability of tests for vocational selection. K. T. Waugh described the results of mental tests of college students as freshmen and as seniors, exhibited devices for transforming measurements into comparable scales, and urged cooperative attention to the mental examination of college freshmen. Elsie Murray was not present and her paper on "Psychological Tests as Diagnostic of Certain Individual Differences in College Students" was omitted. Jean Weidensall reported progress in an investigation designed to establish mental and physical norms for law-abiding efficient saleswomen, waitresses, factory operators, and housemaids, in tests previously used with criminal women. Helen T. Woolley offered a series of norms for school children of the same age as the working children for whom norms have been published. The school children are superior in every respect. A scale combining the two groups is soon to be ready for use. H. H. Woodrow described and illustrated an association-frequency table for children, suggesting interesting differences in association reaction between children and adults. W. V. Bingham described a test intended to give indication of ability to think spatial relations involving three dimensions, a "spatial inference" test employing syllogisms regarding spatial relations, and a learning test based on the substitution principle. D. A. MacMillan proposed the use of tests of perceptual transformation, as contrasted with the more usual performance tests. D. Starch exhibited and described a scale for measuring ability in arithmetic, composed of a series of twelve problems graded in difficulty. Augusta F. Bronner stressed the importance of attitude in relation to performance, with special reference to concrete cases of clinical examination by means of tests. Typical attitudinal factors were enumerated and illustrated. This paper provoked wholesome discussion of the non-rational features of clinical procedure.

A number of papers bore more directly on questions of abnormal and clinical psychology. D. G. Paterson had studied the visual memory for digits of deaf and hearing children, finding the former inferior. The greater the number of years of auditory experience before becoming deaf the greater was the efficiency of the individual. J. E. W. Wallin criticized "the tendency to play fast and loose" with various concepts such as "feeble-minded," and emphasized the many varieties of mental defect. He also gave preliminary results of a census of speech defectives among public school children in St. Louis. S. C. Kohs brought together a large number of cases of mental deficiency in order to present in graphic form their distribu-

tion by mental age and the relation of this distribution to the normal curve of frequency. J. B. Miner advocated a percentage definition of intellectual deficiency and urged more careful description of the border lines of social fitness. Tentative percentage formulæ were proposed and various definitions, coefficients, and boundaries compared with this quantitative expression. S. I. Franz reported cases of recovery of voluntary control in cerebral paralysis, and successful attempts to reeducate several aphasic patients, commenting on the implications of such cases with reference to the function of brain regions and the neural adjustments involved in relearning. After pointing out the unsatisfactoriness of the various theories concerning the etiology of Mongolian idiocy, H. C. Stevens reported an investigation, the results of which suggest that the condition is caused by parental syphilis.

Animal psychology was represented by several papers. K. S. Lashley described the effects of strychnine and caffeine on habit formation (maze learning) in the case of albino rats. A. H. Arlitt has made a similar study of the effects of alcohol, and reported results. H. A. Carr has studied the adaptation of white rats to such factors as degree of hunger, cleanliness of paths, illumination, position of maze and experimenter, handling, etc. R. M. Yerkes described the advantages of a multiple-choice apparatus which makes possible the use of various important methods of procedure in the study of ideational behavior. He also advocated the establishment of an experiment station for the study of monkeys and apes. W. S. Hunter's paper on interference of auditory habits in the white rat reaffirmed the insensitivity of this animal to a certain tone. J. B. Watson had found that delayed feeding seemed to have no effect on rate of learning, and pointed out the important bearing of such results on the "pleasure" theory of learning. H. M. Johnson presented evidence indicating that the dog is not sensitive to gross detail in visual objects.

At the session for general psychology C. A. Ruckmich discussed the present status of psychology as indicated by a quantitative and qualitative analysis of its literature during the last ten years. C. Rahn discussed the definitions of sensation in their historical and systematic aspects. J. R. Angell reviewed the various early and recent criticisms of James's theory of emotion, pointing out that no evidence has yet been brought forward successfully to combat the positive parts of that doctrine. H. S. Langfeld defended the image by the enumeration of situations in which it occurs and by the suggestion of its possible utility. M. Bentley reviewed the psychological antecedents of phrenology and pointed out the influence of Gall on the subsequent doctrine of localized functions. G. V. N. Dearborn

THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

WHAT IS BEHAVIOR?

THE term behavior sometimes denotes such phenomena as the action of oxygen or the motion of a comet, just as at other times it refers to the actions of organisms. Consequently, it is not possible clearly to mark off the subject-matter of psychology by this term alone, because it is not possible to do whatever we please with the established meanings of words. Accordingly, it has been suggested that psychology be defined as the science of the kind of behavior that exhibits character and intelligence. Here are, however, two terms of varied and complex usage that need definition as much as does behavior. To exhibit character may mean to possess positive traits and so apply to behavior, but in the same sense it applies to everything that can be an object of thought; and in what sense can the behavior of lower organisms be said to display intelligence? How are we to understand the character and intelligence of many of the lower organisms with which comparative psychology has to do? To make the question concrete, In what sense can the behavior of white mice be said to display these two traits? From the genetic point of view, character and intelligence may be said to be results and outcomes of behavior rather than its fundamental attributes. Consequently, it seems clear that these two terms are too vague to serve as differentiae of the kind of behavior the psychologist is interested in.

For the science of biology, accommodation and habit are fundamental traits of behavior, and to the present writer they once appeared to be sufficiently simple and definite to satisfy the needs of psychology also. But the more closely these laws are examined the less do they seem to express the real inwardness of psychological behavior. Selection and repetition are still simpler terms and stand closer to the essence of the matter. All living, whether organic or mental, involves selection and repetition among the acts of individuals and species. Habit is the tendency of living things to get again a good that has once been achieved; accommodation, the tendency to prefer more adequate procedures, the tendency of living

things to pursue a larger good. In the great majority of organisms both processes are unreflective, and among reflective beings both become less reflective as they become more habitual. Reflection appears when habit and accommodation prove to be inadequate ways of meeting the conditions of life.

Both habit and accommodation have been represented as purely physical and chemical phenomena. In Spencer's psychology reactions to stimuli are determined in the first place by the energy of the stimuli and the physical properties of the organism. A wave of molecular change follows "the line of least resistance" and issues in movements the energy of which is equivalent to the energy of the stimuli acting under the conditions of their transmission through the organism. Repetitions of the stimuli bring about repetitions of the movements, because "the line of least resistance" will have been rendered "more permeable" by the first process. Thus habits are established and habits induce nerve fibers and psychophysical organization.

In criticism of this description of mental life in terms of physics and chemistry, it has been pointed out that stimuli do not recur in the regular and periodic manner here presupposed. Growth takes place not so much by favor of a fostering environment as in spite of one that does not foster it. Life is from first to last and in all its phases a struggle. The life of an organism is a process of *getting* the proper stimuli rather than a passive reception of them from without. A certain power of selection, as well as repetition, appears to be characteristic of living tissue everywhere. Organisms react to stimuli not so much according to the nature of the stimuli as according to their own nature, and growth takes place by reacting to old stimuli in new ways as often as by reacting to new stimuli in old ways. It is the problem of the science of biochemistry to describe this process in terms of molecular change; but for other branches of biology and for the kindred sciences of human life, the fact that organisms singly and in groups behave in ways that tend to keep up and maintain the organism and its species is most fundamental.

Habit is not distinct and separate from accommodation and selection. Stereotyped repetitions of previous activities do not, as a rule, occur in actual living; actual living is a continual reformation of habitual tendencies. Among all higher organisms imitation and suggestion operate to modify congenital systems of active tendency, and to render life social. It has for years seemed to the present writer that the science of psychology, based as it usually is on the reflex arc conception of psychophysical activity, should adopt a new foundation. The reflex arc with its afferent, central, and motor segments is an attempt to describe mental life in terms of matter and motion,—

urged psychologists to devote more attention to movement and *cœnesthesia* as explanatory of mental process.

Most of the remaining papers were on specific experimental problems, some of them having direct educational bearing. K. M. Dallenbach is attempting to measure attention in terms of attributive clearness of cutaneous sensations. G. F. Arps reported a study aiming to determine the efficiency of perception of differences in length of areas, and to analyze the various factors involved in such judgments. M. F. Meyer described an unusual case of color-blindness. J. Peterson described binaural beats as but a shifting of the apparent source of the sound, to be explained on the same principle as is the perception of phase differences. Stella B. Vincent reported the results of the examination of a tongue rendered partially insensitive after loss of the *chorda tympana*, suggesting various explanations. E. K. Strong concludes, on the basis of experimental data, that recognition is based on the ease of nervous discharge over old associational paths, and that this ease is measurable in terms of reaction time. Florence E. Richardson described a dramatic class experiment in perception, in which bystanders, drivers, and traffic policemen estimated the speed of passing automobiles. Cecile White reported the results of studies of the ability to solve a graded series of puzzles, disclosing learning types, individual differences, etc. Helen Clark presented in concrete and objective terms some of the characteristics of a "crowd." J. Jastrow's paper on the study of judgments dealt mainly with individual differences and variability in accuracy, consistency, and confidence in judging varied sorts of material. C. L. Hull described and illustrated the quantitative methods he is using in recording and analyzing the evolution of concepts. M. E. Haggerty, in his analysis of type-writing, is attempting to identify the specific and general habits and to rank them in order of importance for increasing the efficiency of learning. F. N. Freeman is analyzing handwriting coordination of writers of different degrees of development and proficiency, in order to distinguish the characteristics of efficient and inefficient types. Three papers bore on the question of transfer in learning. Freeman is using in this connection a modified form of mirror drawing. H. H. Wylie is using white rats in a problem box. E. A. Cowan is experimenting on the influence of training in concentration on memory for objects. C. T. Gray is studying the differences between good and poor readers, in the endeavor to provide corrective measures for the latter class. H. A. Peterson had measured the effect of reviews under conditions similar to those of school work. G. W. A. Luckey emphasized the importance of properly directed research as a means of teacher training. F. L. Wells stressed the importance of the quantitative study of such significant facts as birth, breeding,

home-environment, education, sexual adjustments, income, and various factors of success—factors which laboratory experiments fail to take into account.

In the symposium on the academic relations of psychology, H. N. Gardiner and R. M. Ogden presented papers on "Psychology and Philosophy"; Max F. Meyer a paper on "Psychology and Science"; C. H. Judd and M. E. Haggerty on "Psychology and Pedagogy." These papers were followed by informal discussion by Swift, Tufts, Dearborn, Ruckmich, White, and others.

The presidential address by Professor John B. Watson, was on "The Place of the Conditioned Reflex in Psychology." The speaker described the nature of the conditioned reflex, its employment in the study of animal reactions, and its feasibility as an instrument in the study of discrimination, learning, and similar problems in the case of the human being. Lantern slides were displayed showing the methods and apparatus in use at the Johns Hopkins laboratory. Brief account was given of a number of studies there under way, in which the conditioned reflex is the principal instrument of research.

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REVIEWS AND ABSTRACTS OF LITERATURE

Buddhist Psychology: An Inquiry into the Analysis and Theory of Mind in Pāli Literature. Mrs. C. A. F. RHYS DAVIDS. The Quest Series, edited by G. R. S. Mead. London: G. Bell and Sons, Ltd. New York: The Macmillan Company. Pp. x + 212.

To the long and great work conducted by Dr. T. W. Rhys Davids in opening up the riches of the Pāli Buddhist canon an equal enthusiasm is brought by his pupil and wife, the authoress of this manual—a trifle in size only. Though like her husband placing pure scholarship first, Mrs. Rhys Davids finds time amid the editing of texts for occasional translations and other writings not to be set down as "popularizations," but as interpretations for the non-specialist. It is well that this necessary work be done by one who can write with highest authority.

With all the libraries that have been printed about Buddhism since it first reached the West, it still awaits its rightful place in the histories of the sciences. Jurisprudence, medicine, and the psychology of religious experience could long ago have drawn from it interesting material for comparative studies. As a philosophy it might be taught together with the Greek systems and in the same dispassionate way. Especially important, however, is the contribution that it can make to the history of general psychology, for Buddhism *consists* of psychology, both in its premises and in the dreary lucubrations of its schoolmen. While other religions speculate upon theology, this concerns itself with the mind of man—primarily

what he is not, and incidentally, but very elaborately, what he is. Buddha's chief polemic against the Brahmins was his denial of the *ātman*, or self, an inlet from the ocean of *Atman* or World Soul and thus superior to the laws of causation, evil, and impermanence. Mrs. Rhys Davids suggests that Buddha might have found a place in his system for the soul if it had meant to him only an erant, fluttering sprite according to the classical European notion.

In regarding mind and its properties as ever-changing compounded functions, the Buddhist sages so anticipated many of our recent psychologists that curiosity may well be aroused to compare their theories minutely.

Many persons probably suppose that Buddhist philosophy is idealistic. That is true enough of certain sects, found notably in Japan and influenced perhaps by the Vedānta, but idealism does not rule the primitive doctrines which are held by the Theravāda, or Southern Buddhist school, and are contained in the Pāli canon. Here the natural elements are considered real, although in flux, and the object, if not very substantial, is less unsubstantial than the subject. External things are the "food" or stimuli which cause flashes of intelligence in us. Mind or consciousness after the Buddhist theory is defined by the authoress as "intermittent series of psychic throbs associated with a living organism beating out their coming-to-know through one brief span of life."

Man is divided into five classes of properties and qualities called the *khandhas*, or aggregates. First come the material, *rūpas*, a group wherein are brought together various things more or less concrete, but which a westerner would hardly think of coordinating. Second are the feelings, *vedanās*, comprising the five physical sensations with memory as a sixth; all may be pleasant, painful, or indifferent. Third come the perceptions, *saññas*. The fourth class, *sankhāras*, forms a large and important group. The term is of constant use in Buddhistic literature. It literally means confections or compounds, but practically denotes tendencies or potentialities and includes many kinds of mental activity as against the passive states of consciousness already considered. Fifth is *viññāna*, which must be translated consciousness; its distinction from *saññā* is hazy. To give a full inventory of items under these five heads as they are catalogued in some Buddhist books, although not in this manual, would reveal duplication and confusion, according to our way of thinking, but on the whole an admirable insight and power of analysis.

The *khandhas* as such are discussed by Mrs. Rhys Davids in her chapter on Consciousness. In the preceding one she has studied the different Pāli words for Mind. The chapter on Feeling touches a vital spot in Buddhist philosophy, which is deeply hedonistic, although not in a bad sense. Ramified ways are followed in the two chapters on Ideation, wherein the mysteries of *jhāna*, or ecstatic trance, receive a share of attention.

From early authorities primarily, the authoress has collected her material. About half of her space is devoted to the Nikāyas, homiletical books which fill the Sutta "Basket" of the Pāli canon. A chapter is given to the scholasticism of the Abhidhamma Basket, which the late Professor

Warren, of Harvard, compared to the Desert of Sahara, respectable for immensity; while another is based on the "Questions of King Milinda," a helpful patristic writing. A dictum from the last asserts that animals are capable of reasoned thinking (*yoniso-manasikāra*), but not of insight (*paññā*). Mrs. Rhys Davids elsewhere expresses surprise that Buddhism, for all its sympathetic understanding of animals, has given little study to their psychology.

Finally, comparisons are made with a few medieval developments, notably Anuruddha's *Abhidhammattha-saṅgāha*, already published in English by S. Z. Aung and Mrs. Rhy Davids as "The Compendium of Philosophy." This and her "Buddhist Psychological Ethics," translated from the *Dhamma-saṅgani* book of the *Abhidhamma* Basket, should not be overlooked by students of the subject before us.

Buddhist psychology does not recognize the brain as the organ of intelligence, but it postulates a special seat for each of the senses and later commentators have apparently focused these in the heart. There come to mind in this connection two curious passages in the *Vinaya* Basket (older presumably than the *Nikāyas*) to which Mrs. Rhys Davids might have alluded. In one of these a boy's parents object to his learning arithmetic lest his breast become diseased. In the other, Buddha's physician *Jīvaka* removes from a man's head two worms and prevents their reaching the brain, thus recognizing it as a vital region if not the habitat of thought.

"For Buddhists," says our authoress, "the dissolution of the factors of a living individual at death was complete: body 'broke up' and mind, or the incorporeal, ceased. But if, in the final flickerings of mind or *viññāna*, there was a coefficient of the desire to enjoy, involving a clinging to, or grasping after life wherewith to enjoy, then those dying pulsations, as cause or condition, *produced their effect*, not in the corpse, but in some embryo wakening elsewhere at that moment to life, it might be in the next house, it might be in some heaven or purgatory." This is interesting because it explains as a definite telekinetic action that self-reproduction which our Buddhist students have often perhaps looked upon as more vague in its working.

Besides the scholastic questions to which Mrs. Rhys Davids confines herself in discussing the Buddhist theory of personality is one phase which, for readers of a certain class, should prove far deeper. It shows the possibility of reasoning from the premises of materialistic monism to a belief in immortality. To some thinkers, who have seen no alternative between monistic negations and the difficulties of dualism, to them insuperable, this plea of "confession and avoidance" may be a way of escape. This will, of course, be through suggestion, not through credence in detail. The spirit is thus regarded, not as a flitting bird, but as a force or, we may say, an unspringing seed. Socrates might not have meant this, but he hinted at it when, in the "Phædo," he said that the soul, passing from the body, quickly falls into another and "grows up as if it were sown." Here, after all, we find ourselves coming around to St. Paul's ideas on the grain of wheat; we discover that the Buddhist notion has much in common with the Hebrew doctrine of physical resurrection, as against the usual Greek

concept of discarnate spirit life. That seed, that link in the chain of being which Buddhists call *kamma* (*karma*), seems too slight a thing to carry much individuality, but so does every germ. If there be no continuity of historical memory, still an inferential memory, so to speak, may fill the moral requirements.

The statement of facts regarding Buddhist psychology contained in this review is no epitome of Mrs. Rhys Davids's manual, but is rather the starting-point from which she enters the jungle of ideas. She is a path-breaker rather than a clearer of the ground; no wonder if we find it hard to see the forest for the trees. A reader will lose his way hopelessly unless he enter equipped either with the rudiments of Buddhist philosophy or with such knowledge of general psychology as will enable him to grasp the ideas, aided by Mrs. Rhys Davids's broad scholarship and command of technical language. Elementary students should use the book under guidance. To advantage, the matter might have been more clearly arranged or at least summarized in tables. For lack of this the book may well be read with some simpler account of Buddhist psychology as an introduction. Such is Chapter IV of T. W. Rhys Davids's "Buddhism," a little volume published in London as one of the "Non-Christian Religious Systems" series and not to be confused with his American Lectures of the same title.

As a final judgment, the existence of Mrs. Rhys Davids's new manual removes all excuse hereafter for absence of the Buddhist theory from a place in any curriculum that pretends to set psychology in its historical relations.

EDWARD P. BUFFET.

JERSEY CITY, N. J.

The Social Problem: A Constructive Analysis. CHARLES A. ELLWOOD.
New York. The Macmillan Company. 1915. Pp. 225.

On its negative side, "the problem before us is not how to avoid political revolution, but rather how to avoid the decay and disintegration of society itself." Positively speaking, the problem is simply that of "human living together." To this end society must control "heredity, social environment, and personal education." For the first the means is to be found in eugenics. For the second, so far as the economic environment is concerned, the author favors, not socialism, but the intermediate programme of social reforms, including labor insurance, minimum wage, free employment bureaus, "free justice," and, finally, with special emphasis, the scientific reform of taxation, which shall make "findings" rather than earnings carry the main burdens. These "findings" include bequests, the unearned increment in land values, and "speculative profits." In regard to social environment on its spritual side, we must have a "revaluation, in a thoroughly social and humanitarian sense," of family life, government, religion, and morality. For this the author looks chiefly to personal education, which is to stimulate the rational and altruistic sides of human nature and to repress mere instinct and mere egoism. To procure the social organization which will promote these ends we require

trained social experts or efficient social leaders. "The universities produce experts in law and medicine and agriculture and engineering, but experts in the problem of human living together, very rarely; yet these experts are the ones most needed at the present time if western civilization is not to perish through its failure to solve the social problem."

The general tendency of the book is against a material or economic view of the foundations of society,—views which the author calls "negative," because they omit the vital spiritual factor. The work hardly calls for much comment. The titles of chapters raise hopes of a somewhat more specific solution than the author is in a position to furnish. There are stretches of the book in which he is hardly successful in keeping his head above the waters of utter commonplace. The references at the close to trained leaders and to the university as the institution which is to train them interestingly recall the principle laid down in J. S. Mill's early essays, the principle which went so far to shape the whole production of his life, a principle, however, which seems no nearer realization in our time than his. Yet Mill was more specific in the steps he recommended than our author in the present idealistic and amiable volume.

DICKINSON S. MILLER.

GENERAL THEOLOGICAL SEMINARY,
NEW YORK CITY.

JOURNALS AND NEW BOOKS

THE JOURNAL OF ABNORMAL PSYCHOLOGY. August-September, 1915. *Constructive Delusions* (pp. 153-184): JOHN T. MACCURDY and WALTER L. TREADWELL. — Three cases are analyzed and an endeavor made "to establish the claim that delusions in dementia præcox which take the form of objective speculations rather than subjective experiences are an evidence of a milder psychotic reaction and hence warrant a prognosis of chronicity rather than deterioration." The "scattering of thought arises from a failure to formulate underlying fancies in an objective way." Insanity of ideas depends "on the critical judgment of the age which produces them," and there are "essential psychological differences between creeds and religious delusions." *Socrates in the Light of Modern Psychopathology* (pp. 185-200): MORRIS J. KARPAS. Socrates is considered the father of psychology and the grandfather of modern psychopathology. Many quotations are made and a bibliography given which illustrate the author's point. "The Socratic conception of the unconscious conforms in many respects with our present knowledge of it, especially in so far as our psychoanalytic experience shows us conclusively what a potent factor is exercised by the unconscious in the determination of psychotic and neurotic phenomena. Indeed in the Socratic sense such manifestations are anti-social and can not be identified with virtue, hence they are not conscious. One may say Socrates unconsciously conceived the modern idea of the dynamics of the

unconscious." *Psychoneuroses among Primitive Tribes* (pp. 201-208): ISADOR H. CORLIAT.—To understand clearly the mental traits of Indian tribes as a source from which curious nervous attacks develop, a study of their dreams, their system of taboos, and their myths is made. The dreams of these primitive races strongly resemble the dreams of children. The myths are the savages' day-dreams. The primitive people resemble children, and their attacks of violence or furor are sudden emotional reactions, perhaps hysterical. *Two Interesting Cases of Illusion of Perception* (pp. 209-212): GEORGE F. ARPS. A description of two interesting cases, a boy aged nine and a girl aged six who experience illusions of perception, is presented. *Reviews*: H. H. GODDARD, *Feeble-mindedness, Its Causes and Consequences*: W. E. CASTLE. J. B. HANNAY, *Christianity: The Sources of its Teaching and Symbolism*: ERNEST JONES. HENRI BERGSON, *Laughter: An Essay on the Meaning of the Comic* (Translation): ERNEST JONES. *Addresses and Papers at the Opening of the Phipps Psychiatric Clinic, Johns Hopkins Hospital: The American Journal of Insanity*, Special Number, Vol. LXIX, No. 5: MEYER SOLOMON. *Books received*.

Krakowski, Edouard. *Les Sources Médiévales de la Philosophie de Locke*. Paris: Jouvre et Cie. 1915. Pp. 215.

Mach, Ernest. *The Science of Mechanics: A Critical and Historical Account of Its Development*. Supplement to the Third English Edition, containing the Author's Additions to the Seventh German Edition. Tr. and annotated by Philip E. B. Jourdain. Chicago and London: Open Court Publishing Company. 1915. Pp. vii + 106.

NOTES AND NEWS

A MEETING of the Aristotelian Society was held on January 6. Lord Haldane delivered an address on "Progress in Philosophical Research." After giving an account of the doctrine of the New Realism and the gain to philosophical inquiry as a result of the discussions it had initiated, he said that those phases of experience which find expression in art, mortality, and religion are as real as the phases of which logical atomism takes account, yet neither logical atomism nor the more comprehensive forms of the New Realism are capable of doing them justice. Preeminently in these higher phases of experience the universal is nothing apart from the particular, and the particular, as such, is, taken by itself, equally unreal. The only real actuality is the individual fact, the essence of which is identity-in-difference. It was one of Hegel's services to philosophy that he strenuously resisted the abstraction of universal from particular, discerned in individuality the form characteristic of the object world, and showed that individuality implies a subject-object relation.

Idealism of the type of which Dr. Bosanquet is a representative, he maintained, approaches the New Realism, but whilst adherents to the latter assert that, like other objects of knowledge, universals are extra-

mental and exist after the fashion of substances apart from the subject-object relation, adherents of the former take them to be aspects within a whole, the conception of which becomes increasingly organized as knowledge extends. It seemed to Lord Haldane that the mind, when it is adequately conceived, evinces itself as that which envelops the world, and not as a thing alongside of other things in that world. If universals are to be thought of as existing in an extra-mental world and apart from mind, then physical reality becomes so transformed from the old-fashioned way of regarding it as to exhibit a logical vitality impossible to dissociate from continuity with a psychical system. Either you throw the work of mind on the shoulders of a physical reality, and thereby transform the latter fundamentally, or you connect it with the nature of mind as living in the contents, and then you have abandoned the doctrine of petrified universals. Your Realism, in short, ceases to be Realism, for Idealism is let into the fortress from the back.

In the discussion which followed Dr. Carr pointed out that there was an ambiguity in the term "mind" as employed by the New Realists. Professor Nunn criticized the address from the point of view of the New Realism stating that while consciousness is in one sense a part of a thing, it is not itself a thing; that it is not the emergence of a new thing. Professor J. A. Smith, on the other hand, argued that it was impossible to suppose that the mind could be regarded as having the character of a thing along with other things. Speaking from the point of view of the New Idealism, Professor J. S. Mackenzie agreed that the emphasis laid upon the subject-object relation was a mistake, that the essential doctrine of Idealism was that all reality must be interpreted by means of universals, and thus it approached the New Realism. Professor Hicks urged that there had emerged from the discussion the mischief of employing such vague terms as idealism and realism in philosophy at all.

THE president of Columbia University has nominated the following professors of the faculty of education to be members of a department of educational research, which department is charged with the work of instruction and research leading to the degree of doctor of philosophy for all candidates for that degree who elect education as their major subject; Professors Russell, McMurtry, Monroe, E. L. Thorndike, Sachs, Dewey, and Strayer.

DR. FRANK ANGELL, professor of psychology at Stanford University, has sailed for England to take part in Belgian relief work. During his absence Professor Lillien J. Martin will act as executive head of the department of psychology.

AT Yale University, Dr. Douglas Clyde Macintosh has been advanced from assistant professor of theology in the school of religion to professor of theology.

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AND

SCIENTIFIC METHODS

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

THE SOVEREIGNTY OF THE STATE¹

HEGELIANWISE, we can not avoid the temptation that bids us make our state a unity. It is to be all-absorptive. All groups within itself are to be but the ministrants to its life; their reality is the outcome of its sovereignty, since without it they could have no existence. Their goodness is gained only through the overshadowing power of its presence. It alone, so to speak, eternally is; while they exist but to the extent to which its being implies them. The All, America, includes, "implicates" in James's phrase, its constituent states. They are one with it and of it—one and indivisible. Each has its assigned place and function in the great Whole which gives them life. This is essential; for otherwise we should have what Mr. Bradley calls "a plurality of reals"; which is to destroy the predicated unity.

Of the exaltation of such unity a long history could be written. To speak only of medieval times, it would have to tell of Dante with his *maxime unum* as the *maxime bonum*; nor dare we repaint the picture he drew of that world state which is One because its law is one and its spirit also. State must be, Gregory VII. will tell us, absorbed in Church; and so the eighth Boniface, perhaps with some lingering thought of Aquinas in his mind, will declare the heresy of dualism and straightway make claim to the lordship of the world. *Binarius numerus infamis*—so it was Aquinas wrote; and so it is that your pope must have the *plenitudo potestatis* and your emperor be *legibus solutus*. Thus will they embody all and transcend the shifting variety of an inconvenient multiplicity.

Your medieval thinker deals in worlds; with the Renaissance is born the national State. But only the perspective is altered. Still the problem is this monistic reduction. How to make of many one was surely the problem Henry VIII. confronted when he declared the realm of England to be an empire; for if it is capable of such promotion then is its king imperial, and he may work his will with

¹ Read at the Fourth Conference on Legal and Social Philosophy, at Columbia University, November 27, 1915.

recalcitrant chancellors who look vainly Romewards. So, too, with the Stuart. He mistakes the popular basis of the Tudor throne, and thinks a sovereignty in practise theoretical also. It is his, he urges, by a right divine. Like another Richard II. he feels that the laws are in his own breast; while non-juring Hickes will preach solemnly of the Stuart rectitude as he lays down the gospel of non-resistance.

It seems far off; yet in truth it is very near to us. It would be no inapt definition of politics in our time to term it the search for social unity. Whatever political problems we may consider upon this fundamental question, we shall always ultimately be driven back. How far, and in what way, is our society one? How far is there an interest of the Whole, a monistic interest, which transcends the interests of the Many who compose that whole? It is a fundamental question; therefore—as the “Parmenides” bears witness—it is amazingly subtle and difficult. We shall find, I think, that there is one best method of considering our problem. Suppose that on the one hand we adopt the monist solution, what concrete difference will that make to our political life? If we are pluralists, how does that affect our activities? What, in short, are the consequences of our attitude? It is from them we may deduce its truth.

And at the outset, let us note that we tend, in our political thinking, to adopt a sort of mystic monism as the true path of thought. We represent a State as a vast series of concentric circles, each one enveloping the other, as we move from individual to family, from family to village, from village to city, to county, thence to the all-embracing State. We talk of England, Greece, Rome, as single personal forces, transcending the men and women who compose them. We personalize, that is to say, the collective body. “Rome,” writes Lord Bryce, “sacrificed her domestic freedom that she might become the mistress of others.” Here is a Rome beyond her citizens, a woman terrible in the askepticism of her supreme sacrifice.

Clearly the reality of the State’s personality is a compulsion we may not resist. But the habit is common to other things also. To the American, New York has a personality no less real than that of the Republic. To the shipowner, Lloyds is not the mere sum of its individual underwriters. When we take any group of people leading a common life, to whom some kindred purpose may be ascribed, we seem to evolve from it a thing, a personality, that is beyond the personalities of its constituent parts. For us that personality is real. Slowly its reality has compelled the law, when dealing with associations, to abandon the theory of fiction. A man who looks at the battlefield of Europe will assuredly not deny that certain personalities, England, France, Germany, are real to the soldiers who die for them. A man who would remain cold to an appeal to stand by Eng-

lishmen waxes eloquent over the splendor of England; from all Englishmen he synthesizes a thing greater than they. Think of the momentous consequences of such personalizing and then ask if we dare attribute fiction to its nature. "Our fellowship," wrote Maitland, "is no fiction, no symbol, no piece of the State's machinery, but a living organism and a real person, with body and members and will of its own." If this be true, there are within the state enough of these monistic entities, club, trade-union, church, society, town, county, university, each with a group-life, a group-will, to enrich the imagination. Their significance assuredly we may not deny.

Yet, so we are told, the State itself, the society of which they form part, is mysteriously One above them. "Everywhere the One comes before the Many. All Manyness has its origin in Oneness and to Oneness it returns. Therefore all order consists in the subordination of Plurality to Unity, and never and nowhere can a purpose that is common to Many be effectual unless the One rules over the Many and directs the Many to the goal. . . . Unity is the root of all, and therefore of all social existence." Here is no mystic thought from the East, but a sober German jurist dealing with the essential political thought of the medieval world. Unity, it is clear, there finds laudation enough. And the State as the expression of that unity enjoys a similar benediction. It, too, must be one and indivisible. Trade-unionists and capitalists alike must surrender the interests of their smaller and antithetic group-persons to the larger demands of that all-embracing One, the State. Of that One it is first that you are part; only in secondary fashion do you belong to church or class or race. In the One differences become harmonized, disappear. There are no rich or poor, Protestants or Catholics, Republicans or Democrats, but all are members of the state. The greatest of ideas takes all others to itself. "All Manyness has its origin in Oneness, and to Oneness it returns."

So may be described the monistic theory of the State. It is a theory of which the importance may not be minimized in our time. That this view—largely perhaps from its evident relation to the dominant philosophy of Hegel—has triumphed not only in modern Germany, but also, in some lesser degree, in modern Europe, is the merest platitude in a world where Treitschke furnishes the theme of drawing-room conversation. A time of crisis unifies everywhere what before bore the appearance of severalty. The exclusive State makes an easy triumph.

We have to admit, so your monist philosopher tells us, that all parts of the State are woven together to make one harmonious whole. What the Absolute is to metaphysics, that is the State to political theory. The unity is logically necessary, for were there independ-

ence, one group, as Lotze argued, could never act upon another. Were there independence there would be impenetrability. Yet nothing is so evident as the supreme fact of mutual influence. Pluralism, in an ultimate sense, is therefore impossible; for it would make unintelligible any rational interpretation of society.

Certain implications of this doctrine are worth noting before we attempt any criticism of it. If it be conceded that the analogy of State and Absolute be justified, clearly just as in metaphysics we can condemn the world as a whole, or praise it as a whole, so must the State be good or bad as a totality. It can not be good or bad in its separate parts. Pessimistic or optimistic, you may be in regard to it, but melioristic you have no right to feel so far as the State is concerned. For that which distinguishes your State must be implied in its parts, however various, is in its parts, could we but see it, and an evil part is evil, be it capitalist or labor agitator, only if the State as a totality is evil. We bridge over, in fact, the distinction between right and wrong, between good and bad. It is due only to the limitations of our finite political intelligence. It is not, so to speak, in the State-in-itself. It is only the appearance below which we must penetrate if we would grasp political reality. That is why Mr. Bradley can regard his Absolute—for us the State—as the richer for every disharmony; for that seeming pain is in truth but a minister to joy.

And here clearly enough Sovereignty emerges. The State must triumph and has need of some organ whereby its end may be attained. If we anywhere preach a gospel of non-resistance it is here. We go to war. We must fight with the State whether or no we feel the justice of its cause. When in 1870 the Vatican Council defined papal infallibility Mr. Gladstone was quick to observe that Roman Catholic loyalty was endangered. Did not Sir Robert Peel oppose Catholic emancipation because that sect could not in his view unify its allegiance? Was not the *Kulturkampf* but the expression of Bismarck's conviction that your sovereign must be one and know no fellow? When M. Combes aids in the separation of Church and State, on whatever grounds does he base his attack than this,—that only State rights are real? Corporations—wormlike Hobbes called them—caused but troublesome disease. Forthwith let them disappear that the sovereignty of the State may be unique.

What for us is here of deepest significance is the claim that while the State wills has therefore moral preeminence. We pass, if I may be old-fashioned and use Rousseau's terms, from the Will of All to the General Will, and assume their identity. So that force gains a moral sanction because the *τὸ ἐξ ἡμῶν* is thereby to be achieved. What the State ordains begins to possess for you a special moral sanction superior in authority to the claim of group or individual. Y

must surrender your personality before its demands. You must fuse your will into its own. It is, may we not without paradox say, right whether it be right or wrong. It is lack of patriotism in a great war to venture criticism of it. It has the right, as in this sovereign view it has the power, to bind your will into its own. They who act as its organ of government and enforce its will can alone interpret its needs. They dictate; for the parts there is no function save silent acquiescence.

For practical politics there seems no moral rightness in such an attitude as this. We have, in fact, to deem acts right and wrong. We do point to groups within the State, or parallel to it, and urge that they are really harmful and really beneficent. We judge them in reference to themselves. We take what may be appearance as actually constituting reality. We credit, in short, human knowledge. We say that there is something in appearance. If we can not credit it, assuredly there is nothing in which belief is at all possible. Its finite character we freely admit. We can not know all things. We have to be content with a certain specialism, leaving omniscience to the Absolute.

If, as I urge, we know not all things, but some things, if we know not America and Germany, but England and France, nothing of Julius Cæsar, but much of Napoleon, then we claim the right to make judgments upon them. They stand by themselves, can be known, that is to say, independently. I do not mean that Julius Cæsar is not ultimately connected with Napoleon or that there is no relation between England and America, but simply that there is no necessary relevance between them. Applying this to politics, I mean that we do not proceed from the State to the parts of the State on the ground that the State is more fundamentally unified than its parts, but we, on the contrary, admit that the parts are as real and as self-sufficient as the whole. I do not know England before I know, say, Berkeley Square and London; from Berkeley Square and London I come to know England. But in James's phrase, "everything you can think of, however vast or inclusive, has, on the pluralistic view, a genuinely 'external' environment of some sort or amount. Things are 'with' one another in many ways, but nothing includes everything or dominates everything. The word 'and' trails along after every sentence. Something always escapes . . . the pluralistic world is thus more like a federal republic than an empire or a kingdom. However much may be collected, however much may report itself as present at any effective center of consciousness something else is self-governed and absent and unreduced to unity."

We are urging that because a group or an individual is related to some other group or individual it is not thereby forced to enter

into relations with every other part of the body politic. When a trade-union ejects one of its members for refusing to pay a political levy it is not thereby bringing itself into relations with the Mormon Church. A trade-union as such has no connection with the Mormon Church; it stands self-sufficient on its own legs. It may work with the State, but it need not do so of necessity. It may be in relations with the State, but it is one with it and not of it. The State, to use James's terms once more, is "distributive" and not "collective." There are no essential connections.

We are not taking up the position that the State has no relations with these groups. We are simply denying that the parts must be judged by the State,—the individual German, let us say, by the conduct of Germany. We have not to judge of all things in their State-context. Such a relation is a forced relation. It is charging to the account of your individual German things which are really accountable to Germany. We judge his conduct in life in reference to himself and not in reference to the State of which he is part. In the monistic theory of the State he derives his meaning from his relations; in the pluralistic theory, while his relations may be of the deepest significance, it is denied that they are the sole criterion by which a man ought to be judged. So in the pluralistic view of the State, there are, as James said of the pluralist world, "real losses and real losers," in the clashing of its parts; nor do these add mysteriously to the splendor of the whole.

How, then, it will be asked, is the will of the State to be made manifest? If the State is but one of the groups to which the individual belongs, there is no thought of unity in his allegiance. The answer to that is the sufficiently simple answer that our allegiance is not as a fact unified. In the event of a great war, for example, as a member of the State you may be called upon to fight; as a member of another group, the Quakers, you may be called upon to resist that demand. It seems clear that little is gained by talk of "over-riding demands," of saying, for instance, that the demands of the State are all-important. They are all-important only to the State. The history of societies fatally contradicts the view that in a crisis only the State will have power of compulsion. What of certain miners in South Wales? What of certain Unionists in Ulster? Of militant suffragists? Did not to them the wills of certain groups other than the State conflict with it and prove more intense in their demands? Such marginal cases will in all probability be rare, but there is no sort of guarantee that they will not occur.

Then, it will be protested, you will abolish what lawyers mean by sovereignty. You justify resistance to the State. You deny that each state must possess a legally determinate superior whose will

certain of acceptance. But it is surely evident that no such instrument does exist. We have nowhere the assurance that any rule of conduct can be enforced. For that rule will depend for its validity upon the opinion of the members of the State, and they belong to other groups to which such rule may be obnoxious. If, for example, Parliament chose to enact that no Englishman should be a Roman Catholic, it would certainly fail to carry the statute into effect. We have, therefore, to find the true meaning of sovereignty not in the coercive power possessed by its instrument, but in the fused good-will for which it stands. Men accept its dictates either because their own will finds part expression there or because, assuming the goodness of intention which lies behind it, they are content, usually, not to resist its imposition. But then law clearly is not a command. It is simply a rule of convenience. Its goodness consists in its consequences. It has to prove itself. It does not, therefore, seem wise to argue that Parliament, for example, is omnipotent in a special sense. The power Parliament exerts is situate in it not by law, but by consent, and that consent is, as certain famous instances have shown, liable to suspension. An omnipotence that Cardinal Wiseman can overthrow in 1851, that J. H. Newman can smilingly dissolve in 1870, that constitutes in the judicial committee of the privy council a tribunal for ecclesiastical causes which clergymen of repute will regard as of no authority, and, therefore, neglect, seems to represent an abstraction of the facts. Where sovereignty prevails, where the State acts, it acts by the consent of men.

What guarantee have we, then, in the pluralist view that the will of the State will prevail? It may seem that this view gives a handle to anarchy. It does not, I believe, give any more handle to anarchy than it at present possesses. If we become inductive-minded and make our principles grow out of the facts of social life we shall admit that the sanction for the will of the State is going to depend largely on the persons who interpret it. The monarchs of the *ancien régime* were legally the sovereign power in France, but their will was not the will of the State. It did not prevail because of the supreme unwisdom of the manner in which they chose to assume that their good was also the popular good. They confused what Rousseau would have called their "private good" with the "common good" and Louis XVI. paid the penalty on the scaffold. The will of the State obtains preeminence over the wills of other groups exactly to the point where it is interpreted with sufficient wisdom to obtain general acceptance, and no further. It is a will to some extent competing with other wills, and, Darwin-wise, surviving only by its ability to cope with its environment. Should it venture into dangerous places it pays the penalty of its audacity. It finds its sovereignty by consent transformed into impotence by disagreement.

But, it may be objected, in such a view sovereignty means no more than the ability to secure assent. I can only reply to the objection by admitting it. There is no sanction for law other than the consent of the human mind. It is sheer illusion to imagine that the authority of the State has any other safeguard than the wills of its members. For the State, as I have tried to show, is simply what Mr. Graham Wallas calls a will-organization, and the essential feature of such a thing is its ultimate dependence upon the constituent wills from which the group will is made. To argue that the State is degraded by such reduction in nowise alters, so far as I can see, the fact that this is its essential nature. We have only to look at the realities of social existence to see quite clearly that the State does not enjoy any necessary preeminence for its demands. That must depend entirely upon the nature of the demand it makes. I shall find again and again that my allegiance is divided between the different groups to which I belong. It is the nature of the particular difficulty which decides my action.

Nor is this view invalidated by the consideration that the purpose of the State is larger than that of any other conceivable group, does, in fact, comprehend it. I am not at all certain that this is the case. A State may in theory exist to secure the highest life for its members. But when we come to the analysis of hard facts it becomes painfully apparent that the good actually maintained is that of a certain section, not the community as a whole. I should be prepared to argue, for instance, that in the England before the war the ideal of the trade-unions was a wider ideal than that which the State had attained, one is tempted to say, desired to attain. It is possible, again, to say of the Roman Catholic Church that its purpose is wider than that even of a conceivable world-state in the future; for the State concerns itself with the lives of men on earth, while the Roman Catholic Church concerns itself also with their future existence. And, moreover, it is not so much greatness of purpose that seems important as the capacity to secure intensity of affection. This, as I argued earlier, is surely the explanation of the attitude of those who resist the State. The purpose of their organization is not more vast, but it comes nearer home to what the individual immediately desires; so it has for him a greater momentary validity. He subordinates the will of the State to the will of his group because the latter accords with his desire or his conscience. I think that any one who reflects on the history of opposition to the State will find that this is, psychologically, the most fruitful source of its understanding.

Now I admit quite freely that I have been discussing a sovereignty far wider than that which lawyers are accustomed to recognize. When a distinguished jurist thinks that "sovereign power is that

which within its own sphere is absolute and uncontrolled," and when another equally distinguished legal thinker argues that law rests on sovereignty, I can only throw up my hands. For while, for example, in England, the sovereign power is Parliament, and, broadly speaking, only the rules laid down by it will be enforced by the courts, yet Parliamentary opinion, Parliamentary statute, are the result of a vast complex of forces towards which men and groups, within and without the State, make often enough valuable contributions. It seems to me that you can never find in a community any one will which is certain of obedience. That is why Korkunov is profoundly right when he urges that its phenomena can not be regarded as the manifestation of such unity. I can not too greatly emphasize the importance of a phrase used by John Chipman Gray. "The real rulers of a society," he says in a striking sentence, "are undiscoverable." But with the real rulers must go sovereignty; and if you can not find them it too must be beyond the reach of human insight. When you come to think of it, the sovereignty of legal theory is far too simple to admit of acceptance. The sovereign is the person in the State who can get his will accepted, who so dominates over his fellows as to blend their wills with his. Clearly there is nothing absolute and unqualified about it. It is a matter of degree and not of kind that the State should find for its decrees more usual acceptance than those of any other association. It is not because of the force that lies behind its will, but because men know that the group could not endure if every disagreement meant a secession, that they agree to accept its will as made manifest for the most part in its law. Here, at any rate, we clear the air of fictions. We do not bestow upon our State attributes it does not possess. We hold it entitled to ask from its members that which conduces to the achievement of its purpose not because it has the force to exact their consent, but because what it asks will in the event prove conducive to that end. Further than this we can not go.

There are, in this view, things the State can not demand from its members. It could not, for instance, demand from one of them that he assassinate a perfectly blameless man; for so to demand is to violate for both men the whole purpose for which the State exists. It would have, on the other hand, a clear right to ask from each member such contribution as he can afford to a system of national education, because the modern State has decided that the more educated are its members the more are they likely to fulfil its end. What I mean by "right" is something the pragmatist will understand. It is something the individual ought to concede because experience has proved it to be good. So when the State demands from one of its members toleration for the religious belief of another as a right each should enjoy, it means that the consequences of toleration are more coin-

cident with the end of the State than the consequences of religious persecution. Our rights are teleological. They have to prove themselves. That is why, I confess, one of the main comforts I derive from the study of Aristotle is the conviction that he attempted to delineate a pragmatist theory of the State. He gave to his rights the rich validation of experience; and surely a right that has no consequences is too empty to admit of worth.

The view of the State I am endeavoring to depict may perhaps be best understood by reference to a chemical analogy. The chemist draws a picture of his molecule—it is a number of atoms grouped together by certain links of attraction each possesses for the other. And when a molecule of, say, hydrogen meets a molecule of oxygen something new results. What is there may be merely hydrogen plus oxygen; but you must treat it as something different from either. So I would urge that you must place your individual at the center of things. You must regard him as linked to a variety of associations to which his personality attracts him. You must on this view admit that the State is only one of the associations to which he happens to belong, and give it exactly that preeminence—and no more—to which on the particular occasion of conflict, its possibly superior moral claim will entitle it. In my view it does not attempt to take that preeminence by force; it wins it by consent. It proves to its members by what it performs that it possesses a claim inherently greater than, say, their Church or trade-union. It is no dry *a priori* justification which compels their allegiance, but the solidity of its moral achievement. So, I shall fight for England because I can genuinely accept the rightness of its cause; not because when the call comes I must unheedingly and, therefore, unintelligently obey it.

Surely, too, that State will be the stronger which thus binds to itself its members by the strength of a moral purpose validated. When, for example, your miners in South Wales go on strike, rather than attempt their compulsion by Munitions Acts to obey that for which they feel no sympathy, and thus produce that feeling of balked disposition of which Mr. Graham Wallas has written so wisely, you seek means of finding common ground between their group and yours, you will have done better. Is there not a tremendous danger in modern times that people will believe the legal sovereignty of a State to be identical with its moral sovereignty? Right is a dangerous word—for it is political no less than ethical, and in the hands of a skilful statesman the meaning may be insensibly fused. So it will be preached eventually that where a State, from this theoretic conception of Oneness, has a legal right, it has also a moral right which passes so easily into a moral obligation. Government, then, stands above the moral code applied to humbler individuals. It is almost

unconsciously exalted into tyranny. It gains the power to crush out all that conflicts with its own will, no matter what the ethical implication of that will. I can then well understand why to an historian like Treitschke power can be the end of all things. For then power is moral and becomes more profoundly moral as it grows in extent. Is there the slightest historical justification for such a conclusion?

The thing of which I feel afraid, if the State be admitted limitless power, Professor Dewey has expressed felicitously in a single phrase, so that I may be pardoned if I make use of him to point my moral. "It has been instructed" [he is speaking of the German State] "by a long line of philosophers that it is the business of ideal right to gather might to itself in order that it may cease to be merely ideal." Nor is what he urges true of Germany alone. When you hear in Great Britain of unamiable retired colonels on half-pay writing from the comfortable seclusion of a London club that the working-classes must be compelled to do certain things because the existence of the State is threatened, the voice may be the voice of an English colonel, but verily! the spirit of a certain retired German cavalry officer creeps into that voice. The State may ask the workers for their aid; but the condition must assuredly be, that when it fights, their good, no less than its own, is bound up with victory. It seems to me, frankly, that when many of us use the term "State" at the present time we are performing a mental operation of which the content is essentially different. The State is not the same thing, for instance, to the Kaiser and to Herr Karl Liebknecht. When the former asks for the support of Germans that the State may not perish, he has in mind a thing almost antithetic to what it means for Herr Liebknecht. Is anything gained by ignoring this difference, and urging that this State, so fundamentally different to both men, is to have for both an equally valid claim? Assuredly, as the event proves, that can not be the case.

I have tried to show that the monistic theory of the State, making it sovereign and, therefore, absolute, runs counter to some of the deepest convictions we can possess. I have urged that it will ask from us sacrifices it is against our consciences to give. It may of course be said that such a sacrifice has in it a discipline it is well for men to undergo. But when men begin, at the cost of suffering, to surrender their convictions with a monotonous regularity they will end by surrendering them without a pang. May we not here apply that stinging aphorism of Coleridge—"He loves Christianity better than truth, will love his sect or Church better than Christianity, and end by loving himself best of all?"

In the realm of philosophy, the last forty years have seen the consistent disruption of absolutisms. In the sphere of politics they are assuredly but the expression of what our rulers are fain to believe

from half-instinctive desire. The history of recorded experience seems to show that this kind of dogma is the stumbling-block in the way of all progress. The State has sovereign rights; and those who manipulate it will too often cause it to be used for the protection of existing rights. The two get identified; the dead hand of effete ancestralism falls with a resounding thud on the living hopes of to-day. I said earlier that such absolutism bridges over the distinction between right and wrong. Is it not clearly so? Is it not claimed in Germany that an act is justified when State necessity compels it, and that without reference to the accepted criteria of moral action? In the South African war were there not statesmen who, because they condemned it, were adjudged morally degenerate? Is there not in the United States a tendency to approximate criticism of the constitution to original sin? Please observe that I am only asking questions.

How ever are we to get any worth out of historical experience if such absolutism is to be held valid? Every state then becomes exalted above the moral law. Spain was right in its attack on the Netherlands, and the Netherlands wrong in resisting the attack. Great Britain was right absolutely in the American war of Independence. Truly there is point in Mr. Chesterton's remark that only logic drives men mad.

Such difficulties as this the pluralistic theory of the state seems to me to remove. As a theory it is what Professor Dewey calls "consistently experimentalist," in form and content. It denies the rightness of force. It dissolves—what the facts themselves dissolve—the inherent claim of the State to obedience. It insists that the State, like every other association, shall prove itself by what it achieves. It sets group competing against group in a ceaseless striving of progressive expansion. What it is and what it becomes it then is and becomes by virtue only of its moral programme. It denies that the pursuit of evil can be made good by the character of the performer. It makes claim of the member of the State that he undertake ceaseless examination of its moral foundations. It does not try to work out with tedious elaboration the respective spheres of State or group or individual. It leaves that to the test of the event. It predicates no certainty because history, I think fortunately, does not repeat itself. It recognizes the validity of all wills to exist, and argues no more than that in their conflict men should give their allegiance to that which is possessed of superior moral purpose. It is in fact an individualistic theory of the State—no pluralistic attitude can avoid that. But it is individualistic only in so far as it asks of man that he should be a social being. In the monist theory of the State there seems no guarantee that man will have any being at all. His personality, for him the most real of all things, is sacrificed to an id

which the merest knowledge of history would prove to have feet of clay.

I am well enough aware that in any such voluntarism as this room is left for a hint of anarchy. To discredit the State seems like enough to dethroning it. And when the voice of the State is viewed as the deliberate expression of public opinion it seems like the destruction of the one uniquely democratic basis we have thus far attained. But the objection, like the play queen in "Hamlet," protests too much. It assumes the homogeneity of public opinion, and of that homogeneity not even the most stout-hearted of us could adduce the proof. Nor is its absence defect. On the contrary, it seems to me that it is essentially a sign that real thought is present. A community that can not agree is already a community capable of advance. And if public opinion is not homogeneous where and how is it constituted? How will it prevail? I have already raised these questions. I have urged that the proof is not general, but particular, lies in each special occasion as it arises. And that is to postulate a State far from uniquely sovereign, since on occasion it will not prevail as on occasion it may not be right.

I imagine the absolute Hobbes, who has seen internal dissension tear a great kingdom in pieces, hold up hands of horror at such division of power. Maybe I who write in a time when the State enjoys its beautification can sympathize but too little with that prince of monistic thinkers. And the reason is simple enough. It is from the selection of variations, not from the preservation of uniformities, that progress is born. We do not want to make our State a cattle-yard in which only the shepherd shall know one beast from another. Rather we may hope to bring from the souls of men and women their richest fruition. If they have intelligence we shall ask its application to our problems. If they have courage we shall ask the aid of its compelling will. We shall make the basis of our State consent to disagreement. Therein shall we ensure its deepest harmony. H. J. LASKI.

McGILL UNIVERSITY.

SOCIETIES

THE FIFTEENTH ANNUAL MEETING OF THE AMERICAN PHILOSOPHICAL ASSOCIATION

THE fifteenth annual meeting of the American Philosophical Association was held in Philadelphia on December 28-30, 1915, at the University of Pennsylvania. The meeting promised ill at the outset, partly on account of the small number of those in attendance,

partly because the earlier papers, though interesting in themselves, failed to provoke discussion. Before its close it impressed every one as having been decidedly successful.

The prevailing epidemic of influenza was no doubt largely responsible for the small attendance. One heard of several cases of severe illness, either of members of the association or in their families; and among those who were present there were a number who seemed not very vigorous. Especially regrettable was the absence of the secretary, Professor Spaulding, on account of the serious illness of his wife.

One thing that helped the meeting to triumph over all disadvantages was the thoughtful hospitality of the University of Pennsylvania. In particular, the serving of a tasty and substantial luncheon, just at the door of the auditorium in Houston Hall where the sessions were held, was a rare and much appreciated convenience. It made it easy for every one to meet his friends and to make the acquaintance of the young newcomers—always one of the pleasantest, and not the least profitable, features of these annual gatherings. Besides, it ensured that at least the afternoon sessions should begin on time, which, I fancy, very nearly makes a record for this association.

The peculiar feature of the meeting was the dedication of the first two sessions to papers in honor of Professor Josiah Royce, together with the Wednesday evening dinner at which he spoke. As Professor Royce himself remarked, these sessions constituted a new departure, as the like had apparently not been done before for a living man. He was naturally somewhat curious to learn who had been responsible for the idea; but no one seemed to know. All that any one would say was that the original suggestion had been for a *Festschrift*, and that somehow this other plan had taken its place. Perhaps the *Festschrift* may materialize, after all, as it is now proposed to gather all the appropriate papers into a volume. Professor Creighton offered to devote the May number of the *Philosophical Review* to this purpose, enlarging it if necessary. I do not understand, however, that any conclusive arrangements were made.

As I remarked above, the earlier papers provoked little discussion. Professor Dewey, who, unbeknown to himself, had been assigned the first place on the programme, did not appear till Wednesday; and Professor Horne opened with his attempt to exhibit the educational ideal involved in Professor Royce's philosophy. No one offering to make any comment, Professor Royce was asked to say a few words. His response was interesting and characteristic, and it was repeatedly referred to later. He said that in attempting to formulate his educational views he had always been embarrassed by an internal conflict of tendencies. On the one hand he felt himself a rebel, a natural-born dissenter, always prompt to challenge an accepted

standard; while on the other hand he recognized that salvation for the individual lies in union with the community. All philosophies of education had been repellent to him on their formalistic side. And hence he had never worked out a theory of his own.

The meeting was fortunate in being favored with papers by two of Professor Royce's pupils who are now members of the medical profession. One of these was Dr. R. C. Cabot, who spoke of Royce's character as a teacher, emphasizing particularly his sympathetic tolerance of differences of opinion, and its effect in compelling the student to enlarge his own ideas. Professor Calkins spoke of Royce's theism, especially as embodied in "The Conception of God" and "The World and the Individual." The paper contained an abundance of well-ordered data and some interesting conclusions, which at another time might have been eagerly debated, but which fell on apathetic ears. Miss Calkins insisted upon the individual self-consciousness of the Roycean absolute; also, though perhaps more doubtfully, upon the distinction between the absolute and the universal community. Even in his later works, she said, he did not maintain that the community is a person, but only that it may be loved and served as one. The first session was concluded by the reading (by Professor Hocking) of Professor Howison's paper on "The Significance of Royce's Work in Philosophy." This contained a good deal of biographical material which one will be glad to see preserved in print. It also contained a summary criticism of two all-important features of Royce's philosophy: his inference from an epistemological to a metaphysical monism and his voluntarism. This last, it was urged, despite the absolute character that was attributed to it, can not fail to exhibit the instability of every theory that bases truth upon desire. It can only end in anarchism, and has indeed been amply refuted by Royce himself in "The World and the Individual."

If the afternoon session began on time, the president's address restored the violated tradition by beginning half an hour late. Not that Professor Armstrong was responsible for this; for he was at the hall at the time appointed; but as there were only two or three others as prompt he was constrained to bow to the will of the community. The address on "Philosophy and Common-sense" seemed to many of us to be one of the best that our lengthening line of presidents has given us. It undertook, in the first place, to exhibit in the clearest light the shifting character of common-sense; and, in the second place, to vindicate the great democratic function of philosophy as one of the forces that determine the development of common-sense, especially in its ethical aspect.

Wednesday morning's session began with a paper on the classification of delusions by Dr. E. E. Southard, the neuropathologist. He

offered it as an illustration of the method of research that has been employed in recent years in Professor Royce's logical seminary. The method is that of *superposition of schemata*: the arbitrary application to a given subject-matter of the principles of classification that have gained acceptance in some widely different field. In this instance the distinctions of person, number, gender, voice, and mood, which grammar finds in various forms of the verb, were applied to types of delusion. The paper at once showed the altered temper of the meeting by the discussion which it excited. Professor Calkins called attention to the psychological character and value of the grammatical distinctions referred to. Dr. Cohen took occasion to urge the importance of the study of schemata in their utmost abstraction and generalization, as it is pursued by formal logic. Professor Royce added some interesting remarks about his seminary in "the comparative morphology of conceptions," as he had originally called it. He never knew, he said, what was going to happen in it; but it had been increasingly productive in various ways. Numbers of his colleagues from other departments had been attracted into the seminary. He recommended it strongly to those who wished to give "a planless course, with no effort, but with plentiful results."

Professor Spaulding's paper, read by his fellow-realist Professor Montague, called attention to the realism openly expressed by Professor Royce in various passages of his recent essay on "The Principles of Logic"; and protested against the idealistic position which he found still taken in some other passages. Dr. Cohen observed that this realism is equally in evidence in "The World and the Individual," and attributed it to the influence of Peirce.

Professor Sheldon contended that few had faced and none had solved the problem of the metaphysical status of the object of error; and he offered as his own solution the theory that it is not an unreal being (which would be a contradiction in terms), but real. Unfortunately in writing his paper he had paid no attention to the time which it would take to read it; and as a result his thesis was left in mid-air without any substantial support. This is an old and common offense, and it was repeated at this meeting. In my opinion it has been regarded altogether too leniently by the association. The papers that are thus presented to the association should be written for that purpose, and adapted to the necessary conditions. If the authors wish to expand them for publication later, that is their own affair. Or is this too hard a saying?

Professor Bakewell's paper was in one way the great success of the meeting, for it was given special notice in the Philadelphia newspapers. As it is always well for us to know what our intelligent contemporaries think of us, perhaps the editors will not object to a brief quotation (with corrected spelling) from the *Public Ledger*:

Professor C. M. Bakewell at the morning session, in an address entitled "*Novum Itinerarium Mentis in Deum*," contended that the earlier philosophers [*i. e.*, Fichte and Hegel], rather than Nietzsche and Treitschke, were responsible for the doctrines that led to the war. But other delegates, commenting upon his address afterwards, disagreed with him.

I leave it to the reader to guess from this what Professor Bakewell really said. The whole notice is well worth clipping.

At the opening of the afternoon session, Professor Dewey's paper on "*Voluntarism in Royce's Theory of Knowledge*" was finally read. It turned out to be a piece of purely historical study which no one was ready to criticize. Dr. Hartman's analysis of causation tended to minimize the importance of uniform succession as a factor in the relation, and to emphasize that of interaction. The paper brought out a good many comments, including a thoroughgoing condemnation of the whole enterprise by Professor Creighton, and a defense of it by Professor Sheldon and Professor Dewey. Professor Montague suggested a compromise between the views of idealism and monistic and dualistic realism, as to the relation between the apparent and the real. Professor Shaw, who, like some others, had been surprised to find his name on the programme, had not his paper with him, and gave a spirited talk on modern individualism.

The dinner at the Walton Hotel will not easily be forgotten by any of those present. "When all had put from them the desire of meat and drink," President Armstrong read from a most interesting and impressive array of telegrams and letters that had been received from friends and admirers of Professor Royce: notably from Professor Palmer and President Hibben in this country, and Bergson, Boutroux, and Bosanquet abroad. Then Professor Royce spoke. I fear that I can give the reader but a faint impression of his speech. It was a retrospect of his spiritual life. He began with his childhood in a mining-town a few years older than himself. He told of the pitiless persecutions which he endured, as a red-headed country-Jake, from the boys of a San Francisco grammar school. This was his introduction to the "majesty of the community." He told of the inspiration that had come to him, a few years later, from the philosopher-geologist Joseph Le Conte. It was this great teacher who had given him his first glimpse of the general character of scientific investigation. He told of his study in Germany, and how, through the teaching of Lotze, he had come under the influence of the German idealism; protesting at the same time that he had never been in any real sense an Hegelian, and that, if a comparison was to be made, he owed far more to Peirce than to Hegel. Soon he passed to memories of his maturer experience. He spoke of his deepening sense of the value of social union, and of his own inca-

capacity for most forms of social life. He had been "a helpless lover of the community." He had had no political ability. Even on the committees of the Harvard faculty he had been regarded as a nuisance. The only society in which he had felt himself thoroughly at home was that of his graduate students. William James had often wished that he (Royce) might have a "religious experience." He never had had one, in James's sense; but in the company of his graduate students he had felt what was to him something of the divine—"an effortless sense of being one with the process." He spoke in a few words of the love of logic that had grown in him of late years, and expressed a wish that this experience had come to him sooner. He spoke of his intense appreciation of the honor that his philosophical brethren were now doing him; and then, with a sudden transition, recalled how petty were all personal concerns, while the loftiest interests of mankind were at stake in the European war. He declared, and repeated, that if in this conflict the cause of humanity—"and you know," he said, "what I mean by the cause of humanity"—went down, he had no wish to survive it. And he concluded by reading the greater part of Swinburne's passionate and, as he believed, prophetic poem, "A Watch in the Night."

I have left myself no space in which to say anything in detail about the last morning session: about Professor Ewer's paper on difficulties in the teaching of philosophy, Dr. W. K. Wright's defense of evolutionary ethics, Dr. Slonimski's exposition of Kant's use of the term "experience," or Mr. Swenson's exposition of the anti-intellectualism of Kierkegaard. Many of the members had gone home, but those who remained were more actively interested than ever.

It remains to be said that at the business meeting of the Association Professor Lovejoy was elected president and Professor Singer vice-president; while Professor Spaulding was again reelected as secretary. Professor Pratt and Professor Rogers become members of the executive committee. Committees were appointed to present minutes upon the philosophical services of President Ormond and C. H. Peirce, the committee in the latter case consisting of Professor Royce. Professor Dewey, Professor Hocking, and Professor Lovejoy were made a committee to investigate cases of alleged arbitrary dismissal. It is proposed to make such a committee a permanent organ of the association. The usual number of regular members were admitted; and Professor George Holmes Howison was made an honorary member.

THEODORE DE LAGUNA.

BRYN MAWR COLLEGE.

REVIEWS AND ABSTRACTS OF LITERATURE

The History and Theory of Vitalism. HANS DRIESCH. London: Macmillan and Company. 1914. Pp. viii + 239.

The Philosophy of Biology. JAMES JOHNSTONE. Cambridge: Cambridge University Press. 1914. Pp. xv + 391.

Vitalism will not down. A consideration of recent literature drives us to this conclusion. One of the most widely read philosophical works of the past few decades (Bergson's "Creative Evolution") is primarily a defense of this doctrine. The writings of Driesch, both in German and in English, have followed one another with marvelous rapidity and forced themselves upon the attention of even the most unswerving mechanist. And now there comes a volume by a more recent recruit, who has hitherto been chiefly associated in the public mind with the "conditions of life in the sea."

The strength of vitalism's appeal has a twofold basis: (1) the manifest failure of dogmatic mechanism, as thus far formulated, to explain (even in the sense of adequately describing) certain conspicuous facts of development, function, and behavior; and (2) the unpalatable corollaries, religious and ethical, which are supposed to follow inevitably the acceptance of a radical mechanism. Considerations of the former class appeal primarily to the trained biologist, while the latter have most weight with the non-scientific reader. The weakness of vitalism lies in its failure to offer anything but a formal or verbal solution of the difficulties which it raises, and in its insistence on indeterminism, a doctrine which, if applied consistently, would stifle experimental research in biology.

The controversy between mechanism and vitalism is by no means a new one. It dates back to the Greeks. Nor is it an isolated one, apart from other fields of thought. It has many points of contact with the time-honored problems of materialism versus idealism, determinism versus free-will, parallelism versus interactionism, preformation versus epigenesis, and doubtless others.

Driesch, in the volume under consideration, offers us a very useful and interesting historical sketch of the evolution of vitalism from Aristotle to the present day. Both the exponents and the antagonists of the doctrine are given a hearing. We have critical discussions of the views of Aristotle, Harvey, Stahl, Buffon, Needham, Maupertuis, C. F. Wolff, Bonnet, Haller, Blumenbach, Bichat, Kant, Oken, Reil, Treviranus, von Baer, J. Müller, Liebig, Schopenhauer, Lotze, Bernard, Dubois-Reymond, Helmholtz, Wigand, Bunge, von Hartmann, E. Montgomery, G. Wolff, Reinke, and others. Certain of these, who thought they were opponents of vitalism (*e. g.*, Lotze, Claude Bernard) are found, on analysis, to be vitalists at heart, while Bunge, who is commonly identified with that school, owes this fact to his having had the temerity to concede the possibility of a vitalistic interpretation at a time when biologists, almost as a unit, were on the other side.

The "criterion," Driesch tells us in advance (p. 6), "by which we can

test every body of doctrine offered by history" is a recognition of the difference between "static" and "dynamic teleology." The former, while it recognizes the fact of organic purposefulness, regards it as "the result of a special constellation of factors known already to the sciences of the inorganic" (p. 1). This was the earlier view of Driesch himself. The second alternative, to which alone he applies the term "vitalism," is that "the processes of life [are] purposive because of an unanalyzable autonomy" (p. 5). These last words will probably strike most readers as hopelessly vague, but such a criticism, at this point, would of course be premature. It should first be learned whether the author gives them a more definite meaning before he closes.

The volume is divided into two sections, the first historical, the second theoretical. While a résumé of the former section is scarcely practicable, a few points deserve passing mention. Driesch censures scientists at large for their failure to read Kant in the original, and undertakes to fill out this gap in their education by a brief exposition of Kant's views, so far as they bear on biological problems. I am afraid that few of us will be thereby moved to undertake a more exhaustive study of the "Critiques." This is not intended as a reflection on the expositor, whose discussion is largely a running commentary on carefully chosen citations from the philosopher. When Driesch, a sympathetic student and apparently a profound admirer of Kant, admits that many of these utterances are obscure and inconsistent with one another, and when he tells us more than once that "almost any view could find material to support it in the 'Critique of Judgment'" (p. 77), the average biologist may be pardoned if he regards other reading as more imperative. Surprising enough, in view of Driesch's searching studies of Kant, is his confession that, after all, he can not feel sure just what the Königsberg philosopher did believe regarding vitalism, and his expression of doubt as to whether Kant himself really knew. After leading us through a maze of seemingly contradictory opinions, our author states, as his "final attitude towards the biological content of the 'Critique of Judgment,'" that "in the case of man and his actions Kant is indubitably a vitalist, while as regards the facts of organization he is only problematically so" (p. 86).

Historically, we are told, vitalism divides itself into an earlier and a later phase, separated by a gap, occurring during the second half of the nineteenth century, when it was temporarily stifled, or "out-shouted" by the dominant mechanism of the period. Regarding the passing of the older vitalism our author has this to say: "It is said of political parties that they die out when they no longer have opponents to contend with. Something similar is also true of scientific and philosophic theories; . . . they become lax and careless in their logical deductions; they forget to justify every assertion in the light of the theory of knowledge. . . . In such circumstances a doctrine declines and eventually dies. It may, of course, have nevertheless been the right explanation, but what was right in it was buried under a mass of confused and false details. The opposing doctrine which takes its place can not be said to have refuted its predecessor

as a whole; for it has refuted only certain particulars which were wrong and not well founded on it. . . . But, finally, the old theory rises again in a new and improved form, thankful for honest and well-founded criticism, even though that criticism was wrong in its essentials—and that is exactly what happened in the case of the old Vitalism" (pp. 123-125).

In a chapter on "The Critics and the Materialistic Reaction," Driesch repeats his already familiar attacks on "Darwinism" and the zoology of the later decades of the nineteenth century. The virulence and exaggeration which pervade these passages are at times ludicrous: "Darwinism, which explained how by throwing stones one could build houses of a typical style" (p. 137); "Botany [as contrasted with zoology] remained a science" (p. 139); "Animal morphology celebrated a perfect witches' orgy. It elaborated a phantastic construction of so-called 'genealogical trees'" (p. 140); the "laws" fabricated by "general zoology" "simply violated every principle of the formation of scientific concepts" (p. 141); "The Darwinian school studied the construction and development of animals only so far as to compare them with one another, and to concoct genealogical trees" (p. 149).

How did zoology finally extricate itself from this "unworthy state"? "It was, on the one hand, the physiology of form construction which originated in His, and was materially advanced by Roux, and, on the other, the exact researches made upon variations, hybrids, and mutations, which ushered in the much-needed reformation" (pp. 141, 142). And it was this new movement in biology, we note, which likewise ushered in Neo-vitalism. "All new facts which support the theory of the autonomy of life have been won in this field of investigation [*i. e.*, "mechanics of development"] with the exception, of course, of those which are derived from the analysis of human action" (p. 171). As is well known, Driesch's own chief contributions to biology were in the former field.

In this volume and elsewhere Driesch is singularly indifferent to the great scientific awakening which followed the publication of the "Origin of Species." To him its only results of consequence seem to have been the apotheosis of chance and an insensate desire to trace out "genealogical trees." The latter, in particular, are the objects of his scorn. This appears to be less because they were imaginary constructions than because, even if true, they would have had very little importance for biology. Apart from some object or guiding principle, manifesting itself in evolution, no mere description of past happenings, he thinks, can be of much significance. Indeed, he denies our right to apply the term "evolution" to a process thus conceived. It would be merely a "cumulation."

It is doubtful whether most biologists whose work extends back through the past twenty or thirty years would be willing to grant that their early labors had been wasted. Morphology and embryology, guided by the clarifying idea of descent, were certainly much more profitably occupied than before that all-important clue was furnished them. If there was much unbridled speculation concerning genetic relationships, this fact does not vitiate the really great and enduring achievements of the period. Many of the "homologies" established by comparative anat-

omy and embryology will doubtless never be overthrown, while our conviction that true homology denotes blood relationship is one of the crowning achievements of the past century. Such careful descriptive work, indeed such wholly legitimate speculation respecting animal affinities, were necessary before an inquiry could profitably be made into "developmental mechanics" or into the moving forces in racial evolution.

It must be remembered, too, that many of our present leaders in biology were active participants in that "witches' orgy" of twenty years ago. If they passed over in a body to other lines of work, it was due partly to a realization that, at this juncture, the newly opened fields were more promising, partly to the gregariousness of even so highly evolved an animal as *Homo scientificus*. It was no confession of the futility of their past endeavors.

In the second part of Driesch's volume he leaves the historical development of the vitalistic doctrine and takes up its theoretical justification. Unlike his former discussions of the subject (*e. g.*, "Science and Philosophy of the Organism"), the present one does not "*ascend* from the facts to a theory, but *descends* from a theory, *i. e.*, a logic of possibilities, to the fact, *i. e.*, to realities." Thus he gives us for the first time a "deductive Vitalism as a real union of logic and biology, or rather as a sort of filling out of certain departments of logic with biological facts" (p. 188). This would seem to mark the final step in Driesch's progress from an experimental zoologist to a professor of philosophy.

On purely logical grounds, so he tells us, he is able to discover four possible "types of becoming." The fourth type is the one with which, as a vitalist, he is chiefly concerned. This is "becoming which changes the state of the system in such a way that the number of *different kinds of relations* among the things increases without there being any kind of spatial agency that can be made responsible for this increase. In this case 'immaterial' or non-spatial agents must have been at work. . . . The most important form of this type of becoming would be that in which a distribution of the things in one system of the form of a mere *sum* would be transformed into a distribution that would be in some sense a *unity* or *totality*, without any spatial mechanical predetermination of this totality. . . . We shall call this type of becoming *unifying* or *individualizing causality*" (pp. 200, 201). Needless to say, this type of becoming is the one which is presided over by "entelechy."

We fear that the normal, unsophisticated scientist has much the same distrust of a logician that a large section of the public has of a lawyer, and for the same reason. If the interests of his client demand that a proof be found, the successful lawyer will find it—that is the essence of his profession. Correspondingly, we may well query whether a "logical possibility" of vitalism would ever have been discovered except by a convinced vitalist. And we may be perfectly sure that no one who is not already convinced will be converted to vitalism by such a deductive "demonstration."

Driesch's "empirical proofs of vitalism" and much of his subsequent discussion are little more than a condensed repetition of what he has already told us in his "Science and Philosophy of the Organism." His

arguments have already been treated at some length in this JOURNAL¹ by the present reviewer, and further consideration seems unnecessary here. I may say, however, that while I can not believe that Driesch has offered us anything more than a pseudo-solution of the problems he has raised, I believe that the problems themselves are real ones. And furthermore, I believe that in precisely formulating these problems Driesch has conferred a real and lasting service on biology. In recognizing their importance he has displayed a much more profound insight than some of his critics, who are content with repeating mere conventional phrases by way of reply.

Those who knew of James Johnstone only as the writer of an instructive work on the bionomics of the sea² were scarcely prepared for this more recent volume dealing with the meaning of life itself. By many biologists such an excursion into philosophy will doubtless be regarded as the first step in the undoing of a man of science. And the example of Driesch is sometimes held up as a terrible warning. Whether or not this is true in Johnstone's case time alone can tell. Unfortunately for the prognosis, we find our philosopher consigning important fields of organic happening to "spontaneity" and frankly stating that "there are organic differences which have no causes" (p. 242). To accept this viewpoint consistently is to admit the futility of experimental research in what we now regard as some of the most promising fields of biological endeavor. On the other hand, it must be conceded that ingenious experiments have been devised with the express object of determining whether or not vital phenomena are primarily purposive, and that to this extent vitalism has played the part of a working hypothesis.

The work of Johnstone is a skilfully blended mixture of the teachings of Bergson and those of Driesch, a fact which the author freely admits in his introduction. As Bergson's special contributions we recognize "duration," the "vital impulse," the arrest of the dissipation of energy by living things, and the suggestive analogy between the scientific account of natural phenomena and a series of moving pictures; also the relation between the animal and plant kingdoms in nature and the dissociation of originally combined tendencies during evolution. From Driesch are obviously derived "entelechy," the "intensive manifoldness," and many of the biological facts introduced as evidences of vitalism. Indeed, throughout the book, we meet with no important line of argument which is not already familiar to one who has read "Creative Evolution" and "The Science and Philosophy of the Organism." But it would be unjust to let the matter rest here. Johnstone has thoroughly assimilated the doctrines of his two masters and presented them in his own words, illustrated to a great extent by his own examples. He has largely spared us the perfervid rhetoric of the one and the metaphysical entanglements of the other. The outcome is a very readable and suggestive volume, by no means lacking in originality.

As we should have naturally expected, the work is strongest in its portrayal of the fundamental inadequacy of much of the current mechanistic

¹ Vol. VII., pages 309-330.

² "Conditions of Life in the Sea." Cambridge University Press. 1908.

"explanation" of vital phenomena. But I can not believe that either Bergson or Driesch or Johnstone has contributed much to the positive solution of these problems.

Johnstone's argument from the second law of thermodynamics agrees pretty closely with that of Bergson, and is open to the same criticism. Accepting as "scientifically" demonstrated the law of the dissipation of energy and the consequent decrease of diversity throughout the universe, he tells us that nevertheless "we are certain that it is not universally true. For there must always *have been* an universe—at least our intellect is capable of conceiving beginning. . . . We refuse to regard the problem as insoluble, and we must think of the second law as true of our physical experience only . . . we have to seek for an influence compensatory to it" (p. 64).

This sounds promising and we read on expectantly. Living organisms, he tells us, following Bergson, are characterized by their capacity for accumulating energy which otherwise would pass into low-temperature heat and become unavailable for further happening. The energy thus accumulated is subsequently utilized with a minimum of dissipation, since "in the animal organism chemical energy transforms directly to mechanical energy without passing through the phase of heat" (p. 69). Moreover, in living things energy transformations are held to be reversible in a sense that is not true of non-living. "Such concepts as temperature and pressure are *statistical* ones, and are applied to the mean properties of a large number of molecules" (p. 116). The disappearance of molar temperature differences involves the loss of available energy, only because we can not put to use the differences in the energies of individual molecules. This leads naturally to an introduction of "Maxwell's Demons." And the upshot of the whole discussion is that "primitive organisms, or even the tissue elements in the bodies of the higher organisms," may play the part of these demons, and thus possess the "power of directing physico-chemical processes" (p. 119). I may remark that this possibility is made much more plausible by our author than would be inferred from such a bare statement as I have given.

Furthermore, this struggle "towards averting or retarding the progress towards dissipation, or irrecoverable waste, of cosmic energy—that of the sun's radiation, and of the motions of the moon"—is manifested in the activities of all organisms, notably those of man himself. Thus, "life as a whole, on the earth, does not conform to the law of dissipation. That which is true of the isolated processes into which physiology decomposes life is not true of life. . . . Solar radiation falling on sea and land fritters itself away in waste irrecoverable heat, but falling on the green plant accumulates in the form of available chemical energy. The total result of life on the earth in the past has been the accumulation of enormous stores of energy in the shape of coal and other substances. By its agency degradation has been retarded" (p. 82).

This is all interesting and suggestive, though not entirely convincing. But even if Johnstone's whole line of argument be accepted, how far does it take us? The author himself tells us at one point that living things constitute but a "film of inconceivable tenuity" covering the earth's sur-

face. So this reversal of the law of dissipation can not apply to more than an infinitesimal part of the universe. And even here all that is claimed is that "the second law of thermodynamics does not restrict the energy-transformations . . . to the same extent³ that it restricts the energy-transformations of the physico-chemical mechanism" (p. 69). He grants, as he must, the loss of heat by "warm-blooded" animals and even, to a lesser extent, by others.

Is this slight barrier, then, all that stems the torrent of dissipating energy throughout the universe? We look in vain for a further suggestion from Johnstone. Bergson does, indeed, intimate that life is much more prevalent in the universe than we are wont to suppose, but even this admission helps us little. Nothing short of a complete hylozoism would meet the needs of the situation. Unless there are factors adequate to undo the whole work of degradation, the universe is doomed to extinction.

I shall not here discuss Johnstone's other arguments for a vitalistic interpretation of biological phenomena, though they constitute a considerable part of the volume at hand. As I have already stated, they are substantially the arguments of Driesch and of Bergson. It is my belief that they can be met only by departing somewhat from the traditional mechanistic standpoint. The direction in which I believe the solution to lie has already been indicated in my review of an earlier work of Driesch's (*op. cit.*). I hope in the future to amplify this theme.

FRANCIS B. SUMNER.

SCRIPPS INSTITUTION FOR BIOLOGICAL RESEARCH.

The Elementary Forms of the Religious Life: A Study in Religious Sociology. ÉMILE DURKHEIM. Translated from the French by Joseph Ward Swain. London: George Allen & Unwin, Ltd. New York: The Macmillan Company. 1915. Pp. xi + 456.

This careful translation of Professor Durkheim's now three-years-old work will be welcomed by all interested in sociological, religious, and epistemological theory. The translation is literal, hence much of the grace and brilliancy of Professor Durkheim's style has been lost in the process. On the other hand, Mr. Swain, the translator, is himself a student and faithful disciple of the French sociologist, hence we may be sure that the master's meaning has in all cases been strictly adhered to.

The student of social science has long been accustomed to associate Professor Durkheim's work with the pronounced tendency to emphasize the social basis of all socio-psychological phenomena. Never before, however, has this emphasis been so absolute and categorical as is the case in the author's analysis of the religious life. The data for the analysis are furnished by the totemic system of Australia, a field which Professor Durkheim handles with an authoritativeness born of systematic study extending over many years.

At the close of an extensive and painstaking argument the author is led to identify the core of all religion with *mana*, the belief in an imper-

³ Italics mine.

sonal supernatural power. *Mana* itself, however, proves to be but a form of the *totemic principle*, the power at the root of the totemic system. *Mana* and the *totemic principle*, finally, are shown to be of social derivation: *mana* is but a symbol of society, the *totemic principle*, of the clan.

Not satisfied with having thus demonstrated the social derivation of religion, the author extends his argument to the domain of thought itself in an attempt to show that society is the fundamental determinant of the categories underlying the processes of thought.

Professor Durkheim's work, in its English version, constitutes a signal contribution to our sociological and religious literature, while much credit is due the translator for the successful accomplishment of so arduous a task.

A. A. GOLDENWEISER.

COLUMBIA UNIVERSITY.

JOURNALS AND NEW BOOKS

THE AMERICAN JOURNAL OF PSYCHOLOGY. October, 1915. *The History and Derivation of the Word "Function" as a Systematic Term in Psychology* (pp. 473-484): K. M. DALLENBACH. - The word *function* comes into general use with Brown (1778-1820) in his "Physiology of the Mind." The term appears to have originated in works on phrenology. *The Thermal Sensitivity of the Stomach* (pp. 485-494): EDWIN G. BORING. - Thermal sensations of warmth or cold arise either in the stomach or in tissues immediately adjacent to it at 40° C. and 30° C., respectively. *The Self in Scientific Psychology* (pp. 495-524): MARY WHITON CALKINS. - Many psychologists find themselves conscious of a self through experimental and analytical methods of introspection. There still remains a great group of writers who do not recognize the self because the self is always present, other activities have been their chief concern, and the self has been positively ruled out by instruction and rules for introspection. *Grasping, Reaching, and Handling* (pp. 525-539): GARRY C. MYERS. - A detailed account of the development of the grasping, reaching, handling movements of the author's baby during its first nine months. *The Influence of Suggestion on Imagination* (pp. 540-549): GUSTAVE A. FEINGOLD. - Experiments with ink blots and postal cards indicate that imagination is controlled by suggestion in about 25 per cent. of the cases. The more specific the suggestion the less fertile imagination becomes, which has its educational and sociological bearings. *Thanatophobia and Immortality* (pp. 550-613): G. STANLEY HALL. - The child knows little concerning death and the corpse. He desires to know little or nothing. Funeral ceremonies are designed to take the mind away from the decay of the body. Life after death is clung to because death as the end of all is hard to grasp. Medicine, hygiene, life insurance, etc., receive reinforcement in the fear of death. Immortality may be the desire to be remembered and esteemed, still to have influence, to secure the rewards of this life, to leave children, to become a

part of a universal life, to become a part of universal wisdom, to become free. Each of these views is an attempt to make death less fearful. A greater love for the present life in a way partially counteracts thoughts of death. *Book Reviews:* (pp. 614-618); Anna M. Petersen and E. A. Doll, *Sensory Discrimination in Normal and Feeble-minded Children*: SAMUEL W. FERNBERGER. Lewis M. Terman. I. *Suggestions for Revising, Extending, and Supplementing the Binet Intelligence Tests*. II. *Psychological Principles Underlying the Binet-Simon Scale and Some Practical Considerations for Its Correct Use*. III. *The Significance of Intelligence Tests for Mental Hygiene*: FLORENCE MATEER. Lewis M. Terman, *The Effects of School Life upon the Nutritive Processes, Health, and the Composition of the Blood*: FLORENCE MATEER. Lewis M. Terman, *Recent Literature on Juvenile Suicides*: FLORENCE MATEER. John F. Shepard, *The Circulation and Sleep*: SAMUEL W. FERNBERGER.

The American College: A Series of Papers Setting Forth the Programme, Achievements, Present Status, and Probable Future of the American College. Introduction by William H. Crawford. New York: Henry Holt and Company. 1915. Pp. xi + 194. \$1.25.

Richards, Herbert. *Aristotelica*. London: Grant Richards, Ltd. 1915. Pp. viii + 167.

Smith, E. M. *The Investigation of Mind in Animals*. Cambridge: University Press. 1915. Pp. ix + 194.

Stewart, H. F. *The Holiness of Pascal*. Cambridge: University Press. 1915. Pp. lx + 145. \$1.20.

NOTES AND NEWS

At a meeting of the Aristotelian Society on December 20, 1915, a paper was read by Mr. J. W. Scott, entitled "On the Common-Sense Distinction of Appearance and Reality." Common-sense, he maintained, never goes through the world taking things at their face value. On the contrary, it selects one from the many appearances of an entity, and signalizes it as the reality, of which the rest are the seeming, and from a knowledge of which the rest in certain circumstances can be expected. The thesis which the author endeavored to defend was that the "real" appearance possesses the characteristic of being the container, of which the other appearances are the content. He illustrated this thesis first of all by reference to the familiar class of varying appearances consisting in the varying sizes and shapes which a visual object assumes when placed in varying perspectives. As regards the essence of the relationship of containing, it seemed to him that the containing appearance was to the contents that which gave us power over them. The container, as distinct from the contents, was that vantage-ground, which, once seized, cleared a path for thought, as it were, to the contents, and made the transition to them rapid, certain, and easy, and so put them in our power. This power-conferring nature of the former

might be spoken of as its focal character, its centrality. A containing limit *contains* in virtue of the fact that the thought of it is focal to the thought of all its contents. The real appearance is, then, the containing appearance; not the container alone, but the container together with all that it contains. Every "real" is enriched with what it may appear to be. In view of its initial effort to make itself at home in the world, common-sense dare not be satisfied with what it calls the reality and nothing else, rejecting all appearances, for the various appearances which a thing can wear are part of its behavior and are what common-sense comes to learn to anticipate. Common-sense, in learning what to anticipate, has in it a tendency to lose its concreteness. Science encourages that tendency to a much further extent, and, in doing so, it at once brings common-sense nearer to reality, and hides reality more effectively from it. Keeping our eye on the larger facts with which science deals, we are given an infinitely wider range of expectation, which, in consequence, we can not hold all before our minds at once, except by proxy, in the form of abstract conceptions. When, for example, science turns its attention from the ringing bell to the universal fact of sound, it uses this particular noise to introduce us to a whole tract of the universe. But then we are only introduced to it as a child might be introduced to the Atlantic Ocean if it be taken to wet its feet on the coast of Galway. We emerge with the conclusion, the writer argued, that the real is not a few selected appearances only, but that everything that appears at all is real. The real means all that is, and "what is" includes all that it seems to be, except, indeed, what is indiscernible from and so identical with another.

THE following officers were elected at the recent meeting of the Southern Society for Philosophy and Psychology: president, Professor D. S. Hill, of Tulane University; vice-president, Professor E. K. Strong, Jr., of George Peabody College; members of the Council, Professors P. Wardlaw, of the University of South Carolina, J. C. Barnes, of Maryville College, and E. E. Rall, of the University of Tennessee.

THE Section of Anthropology and Psychology of the New York Academy of Sciences met on January 24. The following papers were read: "General Ethnological Notes from Porto Rico," Professor Franz Boas; "Porto Rican Burial Caves," Mr. Robert G. Aitken; "Archeological Work in Porto Rico," Dr. H. K. Haeberlin.

DR. KATE GORDON, head of the department of education, Bryn Mawr College, goes next September to the Carnegie Institute of Technology, Pittsburgh, where she will have charge of the Bureau of Mental Tests and give instruction in psychology in the woman's department of the School of Applied Design.

DR. OSWALD KULPE, professor of philosophy and psychology at Munich, has died at the age of fifty-three years.

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

A NOTE ON THE SENSORY CHARACTER OF BLACK

SOME years ago Professor Ward published an article entitled "Is 'Black' a Sensation?"¹ The question was answered in the negative. Ward believes with Fick that we perceive black objects, but that darkness is simply the zero intensity of the sensible quality "light"; so that what we may call the "sensory content" of blackness and darkness is in reality "the absence of visual sensation."

Ward's arguments have never, so far as I am aware, been met by a rejoinder; and the principal reason, as I venture to think, is that his article broaches an extraordinary number of controversial topics. A full consideration, *pro* and *con*, would fill a small volume. I believe, nevertheless, that the definitely psychological arguments may be discussed within decent limits, and I attempt their discussion in the present note. Ward, in fact, supports his conclusion by two closely interwoven, but logically distinct, lines of evidence: by direct appeal to psychological observation, and by a review of visual theories. On this second path I shall not follow him. For whether Helmholtz confused sensation with perception, whether Hering's physiology is adequate to the psychological data, whether Wundt changed his mind between 1874 and 1905,² whether Müller is more ingenious than convincing—all these questions, acutely as Ward debates them, and necessary as their discussion may be to an historical setting of the psychological issue, are really irrelevant to that issue itself. The important question is whether what we call "the blacks" or what we might also, but for habits of expression, call "the darks" are positive qualities of visual sensation.

We are primarily concerned, then, with the appeal to observation; and we should naturally expect to find in Ward's pages a somewhat detailed study of the visual phenomena in which black plays a part. As a matter of fact, not much is said of vision; Ward prefers to go further afield; and what is said is not always beyond

¹ *The British Journal of Psychology*, I., 1905, pages 407 ff.

² Wundt has replied on his own behalf in *Psychologische Studien*, II., 1906, pages 115 ff.

challenge. We are told, for instance, that "in a light-field many colors may be distinguished, but in a dark field none." Yet "light admits of indefinite increase," and "ranges in intensity . . . up to a dazzling brightness that becomes painful and blinding"; these are Ward's expressions; and Helmholtz had written in 1867 that "with increase of brightness all the simple colors approximate white or whitish yellow." We are asked again (the question occurs in the polemic against Hering): "who ever heard of a blinding black?" Yet Ebbinghaus, writing in 1897 of general adaptation, parallels "dazzling brightness" with "impenetrable blackness": "you have spent the evening in a good illumination, and now you set off home; everything out-of-doors looks impenetrably black; you are at a loss to know how you are going to find your way." The "impenetrable" black that follows upon intensive light-adaptation is definitely "blinding" in its effect; I should not hesitate to apply that adjective to it; and von Kries comes very near the actual term when he remarks that "at first we can not see anything at all."

These two samples may suffice for the present to indicate the treatment of vision: Ward's chief reliance is on the analogy of darkness to silence. Here again he follows Fick, who wrote in 1879: "I find this process [the darkening of a white paper to black] precisely analogous to that in which a particular tone is heard with diminishing intensity until at last it disappears in complete silence."

Let us see how the analogy is used. Where the cessation of sound is striking, Ward remarks, "everybody speaks of the cessation as audible." I do not think that I have ever come across the phrase "a silence that could be *heard*"; the regular expression, surely, is "a silence that could be *felt*."³ This, at any rate, is the only correct verb to apply to a silence which follows upon loud noise. I have made a number of experiments by subjecting observers, trained and untrained, for a period of 30 seconds or more, to the noise of machinery in my laboratory workshop; at the end of the set period the noise was cut off as abruptly as possible. Various organic and kinesthetic sensations are reported, most frequently a slight dizziness and a change of breathing; but all observers find an "oppression" in the region of the drumskins, a "boring" in the ears, a "pressure" in the ears, a "pushing" at the ears, a "feeling as if the ears would burst," and so on. Silence, under these conditions, is not auditory, though it is largely auricular.

³ I am sure that I have read, in works of travel, of silence which (like darkness) could be "felt"; I connect the phrase in particular with the silence following an earthquake. But I can give no reference; and the Dictionaries of Quotations that I have consulted mention neither audible nor palpable silence.

"Nobody would object to defining silence as the absence of all sound," Ward observes, "till he had shown beyond question that it was something more." But in the cases of which I am speaking silence is dissociated both from sound and from its absence; a noise is succeeded by a "feel"; silence, as experienced, is something *else* than sound or the cessation of sound.

If, again, an observer is asked to describe the course of consciousness during a period of time which includes the objective cessation of a weak and continuously decreasing sound, he invariably reports, at the moment of subjective cessation, a marked change in breathing and the relaxation of muscular tensions in head and face; oftentimes, a weak emotion of relief. The organic and kinesthetic feels are, here too, the sensory materials of the perception of silence; and there is no direct realization of an auditory blank such as seems to be implied in Fick's account.

It is true, on the other hand, that if one listens in an objectively quiet place one may catch Preyer's entotic phenomena. I have often verified the observation, in myself and others, when sitting late at night in an inner room of the laboratory. Only one is then listening for—sound; and sound is what one hears, not the "absence of all sound."

Such are the sensory data of silence as they may be observed under simple experimental conditions. The apprehension of silence may occur, of course, in far more complicated settings. Thus, according to Ward, who is now criticizing Stumpf, the "perception of silence wakes the miller when his wheel stops and the clerk when the sermon is ended." Here, however, we must analyze a little more closely. What the miller directly perceives, if his wheel stops in the daytime, is dizziness and ear-pressure. I have noticed these things, at some degree of intensity, when passing from a noisy train into an unusually quiet snow-blocked street, and when the engines of a liner have stopped in mid-ocean. So far the parallel is fairly close, for the mill vibrates as do the train and the boat. But on a calm sea I have slept uninterruptedly through a stoppage of the engines; and the miller might sleep as soundly if he had no special interest in the mill. The various organic stimuli have power to wake him for the same reason that the baby's cry has power to arouse its mother, or the groan of her patient the sleeping nurse, or a mere hint of the scent of fire the dozing watchman. Complex sets and adjustments are here in play, and it is only a Podsnappian flourish that can dismiss the facts to a psychology of perception. As for Fechner's sleeper, he too has his cues: the preacher's change of intonation as the sermon ends, the incipient stir and rustle of the

more wakeful members of the congregation: but it is the fear of ridicule or of social condemnation that has given the cues their sanction. When the whole congregation sleeps, "worldly Tom and Bob and Billy" all together, then Sir Macklin may be removed without disturbing their slumber.

From these considerations it seems to follow that the meaning of silence may be carried consciously in a number of ways: by faint sounds, by dizziness and ear-pressure, by release of breathing and of muscular strains. There are, very likely, cases in which it may be carried by the feel of walking on tip-toe, or may be reinforced by such visual impressions as monotony of color, signs of previous habitation, etc. All this, we may grant, stands upon the level of perception. But when the silence becomes significant, and we enquire for the conscious processes which carry the meaning of a significant silence, then we have passed beyond perception to the levels of association and attitude and acquired interest. Unfortunately, the group of experiences to which this particular mode of apprehension belongs has not yet been brought under experimental control.⁴

There is yet another point in Ward's criticism of Stumpf upon which it seems necessary to comment. We often have a non-auditory consciousness; we may have it under conditions of external quiet, and we may have it despite the presence of fairly strong auditory stimuli, as when we are utterly absorbed in some sight. We are then, for the time being, deaf. In the same way, when we are utterly absorbed (say) in music, we may be, though our eyes are open and are variously stimulated, temporarily blind. Under such circumstances it seems to me that we fail to hear and fail to see with our ears and eyes precisely as we do not hear and do not see with our hands and feet; the distinction here of privative and negative terms is psychologically meaningless; privation, so far as consciousness is concerned, is nothing else than absence.⁵ Stumpf has confined himself to the simplest case, that of the "absence of external stimulation"; and Ward counters by the remark that "when there is nothing to hear we do not say that we do *not* hear in the sense in which we say this of hands and feet." The rejoinder is doubly warranted: for consciousness when there is nothing to hear may still be auditory, and if it is not we may have a positive feeling of privation. But when we are looking back, retrospectively, at a non-auditory consciousness of the kind I have described above, we are, surely, ready to say that we did then no more hear with our ears than with any other part of our body.⁵

⁴ Cf. my "Feeling and Attention," 1908, pages 199 ff.

⁵ There are, no doubt, many occasions of this general kind when, in reply to the exasperated question "Didn't you hear me calling?" we say apologetically

I come now to a portion of Ward's discussion that I find very puzzling. Ward supposes that "we succeed in finding a dark gray to match" the gray of the *Eigenlicht*. "A strip of such gray on a white ground yields a sensation that is darker still." That would, of course, be the immediate result; and we should have a case of what Hering calls simultaneous contrast or simultaneous negative light-induction. Ward then rightly argues that the physiological mechanism of the contrast-effect is, "so far as psychological description is concerned, wholly irrelevant." He proceeds as follows: "Leaving physiological differences aside, we can at least clearly imagine a parallel in the case of sound, which would hold good psychologically, at all events. Suppose we hear a loud sound of constant intensity and quality and simultaneously a much fainter one of different quality. Let the intensity of the latter steadily diminish and the contrast in intensity between the two sounds will steadily increase; and there is *a priori* no reason why we should not attribute this growing contrast to the increasing stillness of the waning sound." I suppose that the louder sound here stands for the white background, and the weaker for the dark gray. But where is the parallel? The gray on the white ground does not grow continuously darker; on the contrary, it gradually lightens (simultaneous light induction). The two sounds, heard together, if tones, would assuredly either blend or beat; and to call a difference of intensity a "contrast" simply begs the question. Furthermore, to "attribute a contrast to" something is to try to explain that contrast, while we were invited to leave explanation for psychological description. And finally, to ascribe "increasing stillness" to a waning sound is to imply that stillness may be perceived as an auditory blank, that its "sensory content" is the "absence of auditory sensation." But this is the very thing to be proved, and we have seen earlier in the present note that the evidence is against such an assumption.

What, then, of Preyer's saying that "just as black is a sensation indispensable to painting so is the rest a sensation indispensable to music?" Our first comment must be that it is unhappily worded. For black is not indispensable either to the painter's palette or to the critic's eye. Out-of-door painters use black pigment very little indeed, and indoor portrait-painters make very varying, individual and manneristic use of it; while one may pass in review a whole wall of pictures without once getting the sensation (or perception!)

"I believe now that I did hear something." I am referring, however, to the extreme, but (for certain persons, at any rate) not infrequent cases, when we say "No! I didn't hear a thing."

of black. It is otherwise with the rest; music, whether we regard it from the composer's or from the hearer's standpoint, depends upon the rest, as it depends upon the hold, for a variety of effects. But these effects are, in the first instance, esthetic, not psychological; and the psychological facts upon which they are based must be worked out, experimentally, in the different cases. Meumann, writing from a wide experimental acquaintance with rhythms, remarks: "Especially striking is the rhythmical effect of the different kinds of 'rests.' . . . The causes of this effect of the rests are an important subject in the psychological investigation of rhythm. I am disposed to ascribe it essentially to the influence of central adaptation to the change of attentional energy, or, in other words, of adaptation to the succession of tones which had been maintained up to the beginning of the rest. In consequence of this adaptation there arises at the beginning of the rest a definite expectation of a similar tonal sequence, and the non-fulfilment of expectation seems to give the rest its peculiar attraction."⁶ This view is offered, no doubt, merely as a general impression; it would have been elaborated and, in all likelihood, modified in later articles, had Meumann been able to carry his labors to completion; I do not myself regard it as adequate. It illustrates, however, what I take to be indisputable, the complex and positive character, psychologically considered, of the rest-experience. A filling by expectation and disappointment is very different from a sheer auditory blank, very different even from a shaped and perceptible auditory blank.

And what, lastly, of Mach, and his parallel of time-shapes with space-shapes? I turn to the paragraph from which Ward quotes, and I find its opening sentence to be this: "I conceive it to be beyond question that there is a peculiar, *specific time-sensation*." One might perhaps hesitate, after reading the text of 1886, to decide whether Mach recognizes simply a specific sensation of succession, or whether besides this (and possibly given with it) there is a specific sensation of duration. But the text of 1900 is explicit. "If a tone *A* is followed by a color or a scent *B*, one is always sure that *B* followed *A*, though the estimate of the interval separating *A* and *B* is not materially influenced by the quality of these sensations. It must be, then, that another and distinct process is involved, which is not affected by variation of the sensory quality, but is completely independent of it, and by which we estimate the time." The alternation of sound and silence is thus, for Mach, an alternation, not of sound and nothing, but rather of sound-time and

⁶ E. Meumann, "Untersuchungen zur Psychologie und Aesthetik des Rhythmus," *Wundt's Philos. Studien*, X., 1894, page 309.

of pure (sensory) time; the "blank" interval has a specific time-content.

"Blue and green," says Ward in his concluding paragraph, "are both positive sensations, because both have assignable stimuli and can occur in any order and independently: black is not a positive sensation, because it has no assignable stimulus and depends solely on the cessation of light, internal or external." But is not the "possibility of assigning a stimulus" irrelevant to psychology? Is not that Ward's own view in other contexts? "If we are to come to the study of our visual sensations without any prejudice, then we must know nothing whatever of the fact that objective light corresponds to white but not to black." That is Hering's statement; but the spirit is surely Ward's as well as Hering's: "the simplest way"—and psychologically the only way—"is to let the facts speak for themselves." But "blue and green can occur in any order." If we are speaking of human vision as it is to-day, then so can black and white; we may see white before black, but we may also see black before white. If we are speaking genetically—well, then we are speaking speculatively. Blue, I take it, appeared earlier than green; and black and white appeared together. Ward too assumes that the primitive sensation of sight consists of a "light" which ranges from complete darkness to dazzling brightness; and as, for reasons to be given later, I can not distinguish between "complete darkness" and black, further argument at this point is needless. "Blue and green" once more "can occur independently." So, in a given visual field, can black and white: a figure may be shown either in black or in white upon a gray or colored ground. Or are we here leaving psychology for physiology? Then, truly, black and white are interdependent, but so also are blue and yellow, green and red; and are not blue and yellow, for instance, positive sensations? Lastly, "black depends solely on the cessation of light, internal or external." Surely an unguarded statement! The "cessation or inhibition of the intrinsic light" is an hypothesis of McDougall's; and it is an hypothesis to be considered; but it has hardly yet attained the rank of established fact. A black, again, will appear on the cessation of external light, provided that the eye is already light-adapted and that the cessation is sudden; if the eye is dark-adapted, or if the external light is gradually reduced (as in twilight), there is no vision of black. Conversely, our ordinary vision of blacks requires the presence of light: Ward writes, in another passage, that Hering has shown "the so-called sensation of the deepest black" to be "possible only under the influence of light."

What, then, are the positive reasons for attributing a sensory character to the blacks? I should say that they are to be found in all the elementary phenomena of vision. These qualities take their proper place on the vertical axis of the color-pyramid, and serve as end-points of chromatic lines within that structure. The facts of adaptation, general and local; the after-effects of adaptation; namely, a modified "sight" or "sightedness" and the negative after-image; the facts of visual contrast; the facts of indirect vision—these are all phenomena in which the blacks play a positive sensory part. They are also phenomena which may be observed, not only by help of black "body-colors," but also when these are replaced by the darkness of an unlit space, such as the interior of a black-walled tube; there is no ground for separating the blacks from the darks. In short, black or dark, so far as we are dealing with sheer looks, is no more the zero-point of white than blue is the zero-point of yellow; and when we proceed to experiment, black or dark behaves just as other acknowledged qualities behave. I can not see that further psychological evidence is necessary.⁷

We should all, nevertheless, welcome an *experimentum crucis*. And there is a hint of one. "Apropos of an experiment which Ward has described," says Ward, "Professor Müller maintains that 'altogether inconceivable' how this experiment is to be explained without assuming the positive character of black. Yet Professor McDougall seems to have done this satisfactorily, and even to have turned the tables by experiments of his own which give results compatible with theories of a special black-process." Müller's truth concerned with a *besondere S-Erregung*, not directly with the positive character of black as sensation; and it is on this ground that McDougall meets him. In other words, the experiment is in the present connection, explanatory rather than descriptive; it is based upon physiological hypothesis rather than upon psychological observation. Since, however, psychology is involved, we may as well give it some consideration here.

Müller's experiment is well-known; he puts a black-red disc upon black and white discs, and finds that the red shows well on the black, and is hardly perceptible on the white. "In order to test this result," upon this result, McDougall puts a gray-red ring upon (the same light gray) and white discs, and finds that the red shows well on the gray, and is hardly perceptible on the white. McDougall argues that contrast-black ought, on Müller's view, to have equal

⁷ It may be remarked that Ward, though his effort to distinguish between sensation and perception is wholly justified, tends to overestimate the rôle of the observer. Whether a black figure, a "shaped" black, shall arouse in the observer a sensation or a perception depends (other things equal) on the observer's attitude.

the red on white, by bringing the gray of the gray-red ring nearer to neutral gray. He has, however, forgotten the *Axiom der Mischempfindungen*. Had he put his gray-red upon black, as well as upon its own gray and upon white, he would have found that the red shows best upon gray, *less well on black*, still more poorly on white; and had he put Müller's black-red upon his own gray, as well as upon black and white, he would have found that the red shows best on black, *less well on gray*, hardly at all on white. (These statements hold, at any rate, for the Hering red, which is definitely lighter than McDougall's light gray.) You can not, that is to say, if you are to get to a positive conclusion, take casual mixtures of light and color (casual gray-reds) and set them upon casual backgrounds of gray; before you work with grays, you must know the course of the chromatic limens, or must know at least the general tendency of that course. We do not, any of us, know either course or tendency; we know astonishingly little of the chromatic values of our colored papers; but we know enough to realize that the knowledge, in a case like the present, is essential to positive argument. Müller himself chose black and white with a reason; he chose them because they were, in the rough, the extremes of the light-series, and therefore gave him a maximal difference of light-excitation. Whatever, therefore, we may think of Müller's "altogether inconceivable" and of the crucial character of his experiment, we must recognize that the force of his demonstration is not impaired by McDougall's counter-experiment.

E. B. TITCHENER.

PERCIPIENTS, SENSE DATA, AND THINGS

THE perennial interest and difficulty of the problem as to our knowledge of the external world is very strikingly shown by the various attempts at a new treatment of the problem in the work of the American "New Realists," in the writings of Professor S. Alexander, its frequent treatment in recent proceedings of the Aristotelian Society, and in Bertrand Russell's "Our Knowledge of the External World."

My own humble contribution to this discussion will be a defense of realism, modified only by insistence on the organic and functional interdependence and correlation of percipients and perceived objects.

One must start with analysis of the simplest kind of knowledge of external things. It will not do to import physical and psychological speculations at the beginning of such inquiry. Speculations

in this field must justify themselves, if at all, by rendering the facts of immediate experience more consistent. Putting aside all sophistication through theories, I find in my immediate apprehension of such things as the tree or the table only two factors, neither of which is reducible to the other. I find the object which I immediately apprehend as real, and the consciousness that I (whatever I may be, whether spiritual Ego or flux of cortically determined processes or mixture of both is now an irrelevant question) apprehend the object. I see that the tree is determinately round, brown, rough, about two feet in diameter, with branches and green leaves. I may call it a complex of sensory or perceptual qualities, but I do not mean thereby that it is a state of my consciousness.

I do not find that I have, as distinguishable factors, sensations which are purely mental processes and sense data (as does Mr. Russell). I am convinced, after prolonged reflection, that the assumption that sensations exist as mental processes has been responsible for most of the difficulties and confusions connected with this problem. I have "feelings" of esthetic joy at the tree's beauty, feelings of pain if a branch blows down and hits me. These feelings are subjectively mine, just as hunger, love, friendship, and all my other emotions. I suppose these "feelings" to be in part, perhaps wholly, due to modifications of my body acting on my conscious self. Perhaps they result from the reaction of my psychical self to occasioning stimuli. Perhaps my psychical self is simply and solely the by-product of the action of a complex neurone-system. I am not concerned here with the metaphysical problem of the self and the body. Feelings and emotions, then, are subjective processes, belong only to this Ego. On the other hand, the sensory qualities of the objects which I immediately apprehend are *in the objects, not in my Ego*. They constitute the object in its objectivity. Mr. Russell says that all that I really see is a patch of color. For my own part I do not immediately see merely a patch of color. I see an object having determinate color, form, texture, etc., all blended together.¹ I can not perceive the one without the other. If I feel the tree in pitch darkness I do not perceive only a tactual surface sensation. The so-called sensations are artificial constructions, which the psychologist has invented in order to account for the genesis of perceptions out of simpler elements and for their multiform variations. Sensations are on the same footing as electrons. The psychologist is prone to say that we learn to perceive concrete objects by correlating visual, tactual, and other sensations. I hold that, from the very outset, and in the case of the vaguest perceptions, we

¹ I do not, of course, mean that there are no mediate factors in my perceptions.

immediately apprehend objective complexes of qualities, and that we learn to perceive better by discriminating and correlating objective complexes, by differentiating and relating their features more fully by analysis and synthesis, thus causing them to stand out more clearly from the vaguer background of the total external reality immediately apprehended. This vague continuum of reality is always the matrix of our determinate perceptions. Perceptual knowledge grows out of a vaguer, less discriminated, and less clearly correlated or coordinated immediate or intuitive knowledge. I do not believe that any baby ever had a purely visual and a purely tactual space, which it correlated. It had what, in psychological terms, we may call a vague and circumscribed visuo-tactuo-motor space field, which it analyzed and synthetized into a more definite or articulate spatial system. So with all of us. If we start with the assumption of sensations, which are just Humian "impressions" as the sole immediately given, we may argue from now until doomsday and we shall never be able to prove that there is an external world. Having started with an epistemological fiction, no wonder we can not get to reality. I suppose sensations were invented, among physicists and philosophers, as a convenient makeshift to account for the variations in human perception, and especially for those features of immediate reality which could not be conveniently measured, as well as for errors and illusions of all sorts. In time, like many another human makeshift, they have acquired the sacrosanct authority of a dogma. As to whether psychology still has need of them, as useful fictions, I leave to the psychologists. I opine that the behaviorist and the functionalist, when they are thoroughgoing, may find that they can dispense with them, except perhaps as pedagogical crutches.

Since I have no sensations, only feelings and immediate apprehension of objects, as complexes of sense qualities, I do not need to suppose that sense data *cause* sensations. I see no convincing evidence that the relation between my immediate apprehension of the tree and the tree is that of effect to cause. They are simultaneous in time and identical in nature. There is more in the tree than I apprehend, but that more is not inconsistent with what I apprehend. If you say that my apprehension is not of the tree as it is in itself, since the tree looks different from different positions and to different observers, I reply that there is no tree in itself as an isolated object and no observer as an isolated subject. Trees and observers are elements in a total spatio-temporal system of interacting things. I have good reason to believe that my being aware of the tree depends on my visual apparatus and on the light in the intervening and surrounding atmos-

phere. The sensory organs and the central nervous system are media of communication between my Ego and the tree, just as the atmospheric light is. If there is variation in any of the media of communication there will be variation in the object apprehended. If it were cloudy I should not see the tree so distinctly. If my eye were defective a similar result would follow. Similarly, this paper does not cause me to write this article. It and this JOURNAL are media of communication between my fellow students and myself. With reference to my cognizing Ego, my nervous system and end organs are just as truly parts of the external world as are the intervening lighted space and the tree. With reference to pure cognition, my whole body is an object in space, among other spatial objects. With reference to my feelings there is a peculiar and intimate relation between this body and my conscious Ego.

The sensory system is a means for enabling a center of consciousness, which, as unitary center of feeling and cognition, is associated in some kind of functional interdependence with a cortical nervous system, to go out into circumambient space and to apprehend the qualities and relations of things. The awareness of external things, as well as the awareness of one's own bodily states, is probably conditioned by cortical changes; but to say that awareness is merely a cortical change is to confuse two qualitatively distinct things. Some cortical change must occur without accompanying consciousness, and the cortical changes which are associated with acts of awareness, with feelings, desires, and voluntary acts, are unique kinds of cortical change by virtue of that association.

Is my mind out there where it apprehends the tree? If so, how can my mind be in my body and over yonder at the same time? The simplest solution of this problem is to admit that my mind is wherever it perceives anything. It is partly out there and partly in my body, since, while perceiving the tree, my mind is also conscious of the straining of eyes and head muscles, conscious that as a psychophysical organism I, as cognitive Ego, am attending to the tree. My mind, as actually conscious, is cognitively wherever the things that it apprehends are. Affectively and volitionally it is always centered in my body. Is it then in China, when I think of China? No. For I am conscious that my thought of China is not an immediate apprehension of China, but a mass of centrally located images. As contemplating or immediately apprehending things, the mind is translocal. To a limited extent and conditioned by light, air, and other media it traverses space with immeasurable velocity. Cognitively the mind is in the body only in so far as what the mind apprehends is its own bodily state. Affectively and volitionally the mind is, to a much greater extent, in the body since both the in-

citements to purposive action and the immediate instruments thereof are bodily. The body is chiefly, perhaps, a means of action. It is also certainly a condition of the mind's apprehension of what is spatially beyond the body. But it is not properly described as a cause of that apprehension, except in a very loose sense of the word cause. Nor does the sensory nervous system necessarily distort the nature of what is beyond itself. It is just as consonant with the facts, and much more in harmony with the conditions of a coherent theory of knowledge—one that does not begin by throwing away the common-sense conviction that we really perceive real things, as though the man in the street were a fool—to say that the sensory nervous system is the medium through which the mind goes out into space and travels around in it as to say that this system is the means by which the external world effects a burglarious entrance into the mind. Surely it is less repugnant to the actual nature of perception to suppose the mind to be a pervasive system or self-expanding entity that goes out into space than to suppose that the whole material world, in order to get perceived, must be concentrated into a dimensionless point somewhere in the brain.

Do I perceive the tree in one private space and you in another private space? Mr. Russell, in his very ingenious treatment in Chapters III. and IV. of "*Our Knowledge of The External World*," supposes every percipient to be like a Leibnizian monad which takes only private views of things. He defines the "thing" as the series of its aspects, and, starting from the series of aspects which constitutes every individual's private views of the thing, he constructs a perspective space, which seems to be the space to which, in some way, every one's series of private space-views refer. I am not at all sure that I follow all Mr. Russell's argumentation on this point. But it seems to me that his construction of a general perspective space is plausible only on the assumption that he already knows that other minds exist, and it is admitted that the existence of another mind is an inference from the existence of another body. But how do I know that your body exists as the habitat and instrument of your mind, unless I already know that there is *one public space* in which your body and my body coexist? At the present moment, for example, I am not, so far as I am aware, in the immediate presence of any other mind. I am apprehending objects within my range of vision. Then in walks my wife and fills up part of this field of vision. Her body has entered that part of public space which I immediately perceive. She obtrudes herself upon my notice and speaks to me. I interrupt my work to reply. Unless I immediately apprehend space as the place of the simultaneous existence and interaction of things I certainly could not apprehend my wife's reality.

A perspective space can not be deduced from "private spaces." For, if we begin with self-enclosed private spaces we can never logically get into the public world and can never find any other mind. The other self—body and mind—must exist in public space. I believe that my wife exists because I immediately perceive one indivisible object—body and soul—in public space. I am not conscious of inferring by any process of ratiocination that her soul is there. I am immediately conscious of a living body which behaves in an intelligent and affectionate fashion. Of course I may be mistaken about her views or feelings on some matters. Then, in trying to find out what she does think or feel, I learn that knowledge in detail of another's state of soul does involve inference. But the immediate apprehension of minds and of the portions of space in which they live and express themselves are two aspects of the same realistic contemplation of things as they are. My knowledge of another mind's existence is logically as "primitive" as my knowledge of my own mind's existence. In both cases, for completer knowledge, I have to reflect, analyze, and infer. It is often quite as easy to know another's mind as to know one's own mind.

Psychological or "private" spaces, are, like sensations, of which indeed they are the "subjective" places, artificial constructions. They are not given, but constructed as the "imaginary" places for the variations in sense-perceptions. It is true that our spatial, like our other qualitative, apprehensions of things, vary. I do not perceive the surroundings precisely as my wife does. But, in so far as these differences of perception are due to differences of position and differences in the structures of our respective sensory apparatuses, the differences, too, are parts of the objective order of things in space. In so far as these differences may be due to differences in our mental histories they are parts of the past objective order which, through memory, functions in the present. In so far as they may be due to inherent psychical and physical differences in the make-up of our respective individualities they are due to what, for epistemology, must be regarded as ultimately real facts.

There is no difference in perception which is not a difference due to the fact that the real world is a system of interacting elements or *individua* of varying degrees of structural complexity. If there be such a thing as a psychical or spiritual principle of individuality, then your individuality and mine are true parts of the objective order, and your private views of things and mine are private only in the sense that one is the consequence of your individuality and position and the other is the consequence of my individuality and position. But individuality and privacy have no meaning except in relation to a public world and as parts of the whole apprehended reality. The real percipient, like the real object perceived, is never an isolated

of experience. Just as a physical thing is a sensory complex and is discriminated from a vague background of apprehended reality, the individual percipient and agent is a felt center of reference for all sorts of relations.

The vague background of reality which we immediately apprehend and the parts of which we differentiate and correlate in the growth of knowledge, is always spatial (and temporal). Space is apprehended immediately as the container or container of existence for all things and their properties. Kant and the empiricists are right to this extent—that an immediate spatial apprehension is presupposed in the barest modicum of perception (and perception with time).

Since sensory qualities change, things when defined as complexes of sensory qualities change and even vanish away. What is the real thing? This is too large a problem to be adequately treated at the tail end of a journal article. I will state briefly what I regard as the right point of view for treating the problems of change, permanence, and substance. In the first place a thing does not change without other things changing in the same spatial and temporal stretch. Absolutely isolated change is no more real than absolutely isolated existence. The ice does not melt unless the temperature rises above 32° F. This statement is a symbol of a multiplicity of other conditions of change. The changes through which a thing ceases to be the same thing involve the interaction of elements in the one spatial whole and in the one temporal continuum of existence.

Just as there is one objective spatial whole at any instant, in which we apprehend only fragmentary, though genuinely real, parts, because we are localized centers in that whole, so there must be an objective temporal order or order of cosmical succession in the changes that we observe and the changes that we undergo ourselves.

What is true in science and philosophy is the pragmatic method more applicable than to this problem of thinghood. For what a sense means by the sameness of the thing is just the sufficient persistence, for immediate apprehension, action, and enjoyment, of certain qualitative complexes which are the actual things. A thing is a groupings of sensory qualities if, and so long as, for any purpose this grouping can be treated as a persisting whole. A thing is the same so long as a self can count on finding the same qualities in the same place in space. I say that I have put some peaches in the refrigerator. When I go there and find the expected complex of edible and pleasant qualities I say that the peaches have kept well. If I find a mush they have practically ceased to be the same. I seek an explanation of the change from edible things to an inedible mess of bacteria. The bacteria are, for purposes of explanation, things;

not for purposes of eating. The thing of common sense is a practical construction, that is, a construction relative to a desire and a purpose, and so is every so-called theoretical construction. Even the attempt to conceive ultimate and unchangeable things, such as atoms or egos, is simply the expression of the desire to get one's mental feet planted on something permanently permanent. The degree of thinghood that any complex of sensory qualities possesses is relative to its fulfilment of a purpose. The things of physics, "atoms," "electrons," are things for the very general and abstract purposes of the physicist. In so far as they fulfill those purposes in a clear and consistent fashion he can treat them as real. But in so far as they do not satisfactorily account for the complex and changing qualities of the empirical world, which are hourly and momentarily real for the fundamental business of individual and social living, common sense is justified in holding that "atoms" and "electrons" are but artificial constructions. Even law, morality, civil polity, art, and letters are full of such artificial constructions; not of course so abstract and unreal as "atoms" and "electrons," since they have more concreteness and individuality in their interpretation and use. And, in the last analysis, the real must be the whole spatial-temporal nexus or continuum which engenders the local and transitory qualitative complexes which we call empirical things and selves. The real world must, in some way, own all the qualities which, for the fulfilment of individual and social purposes, must be taken into account; either as furthering or as hindering these purposes. The real external world owns all the primary and secondary qualities; moreover since we *enjoy* nature selflessly and "uselessly," as well as use some of its powers, the real world must own qualities akin to the esthetic features that we find in it.

Naïve realism does not imply that objects experienced would exist exactly as they are experienced entirely apart from any experient. It does imply that experiencing does not falsify or distort real things. It implies, for me at least, that the percipient as well as the qualities perceived are true integral factors in the objective complex of things. Reality is a vastly complex and changing system which engenders at some places and moments in its career feeling and reacting centers in which its qualities become consciously focused, and through which they are under modification and rearrangement, but are neither created, annihilated, nor radically distorted. A world which can produce selves must have always been a world in which selfhood was implied. A world in which selves live only through dependence on and use and enjoyment of a physical order can never have been a world of disembodied spirits or Egos, whether one or many.

JOSEPH A. LEIGHTON.

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SOCIETIES

NEW YORK BRANCH OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION

New York Branch of the American Psychological Association met in conjunction with the Section of Anthropology and Psychology of the New York Academy of Sciences on the evening of December 22, at Columbia University. Four papers were read, abstracts of which follow.

Relation Between Memory-Span, Attention, School-Grade, and Age.
—CHARLES K. TAYLOR.

A series of experiments were made with about 500 children in the lower grades of a public school, as a result of which interesting relations seemed to appear between memory-span, attention, school-grade and age.

Series of numbers, varying from three to twelve digits, were dictated to the children who wrote from memory each number as soon as dictated. While this was going on the class-room was made as quiet as possible and free from disturbing elements. Two series of numbers, ten numbers to the series, were given under these conditions. Not more than two or three children, it was found, could remember and write down a number of twelve digits after dictation, more remembered eleven, more remembered ten, and so on.

It was found, first, that the average numbers remembered by the children in the lower grades were larger as the grades advanced in age. It was also found that of children of the same age in different grades, those in the lower grades could not remember as large numbers as those in the higher grades. Also, there was a close correspondence between the average of the children and their averages given in the reports.

After a period of rest, two more series of numbers were dictated, one to the first two, but this was done while the teacher read aloud from an interesting book, thus making a disturbing element. By comparing averages in the two sets of series one could gain an idea as to the attentive powers of the children.

It was found that, though there was some relation between the report and "attention" and the school-grade and "attention," the most marked relation seemed to be between age and attention. For instance, all of the sixteen-year children did as well with the disturbing element, or better, than with the quiet. Only 42 per cent of the fourteen-year children and only 32 per cent of the

twelve-year children did as well or better with the disturbing element as they did without it. With the children of eleven and under all made poorer averages with the disturbing element than without it.

Color Therapy.—T. H. AMES.

References brought together, ranging from the most ancient superstitions and folk-lore to modern material from psychological laboratories, give evidence that color was used to conciliate or ward off supernatural beings, to ameliorate abnormal physical and mental conditions and to change the emotional states of normal people.

Color acts for these ends in various ways: By magical charms or sorcery, as a scape-goat, by thinking processes, or by homeopathic and allopathic procedure.

Not only are masses and individuals affected in a similar manner by color, but also the masses and individuals of all nations and all times. The experiment by Wells in the *Psychological Bulletin* of 1910 stating that colors at the red end of the spectrum are stimulating, that those in the central part are tranquilizing, and those at the purple end subduing, agrees in its results with those to be obtained from a study of ancient superstitions.

While the uses of color never have been and may never be demonstrated to be of such value as to become commercialized, still there is sufficient evidence to warrant us in believing that apart from any purely utilitarian or purely esthetic use, color has a place in therapeutics.

Why the Lower Senses are Unesthetic.—H. L. HOLLINGWORTH.

The speaker reviewed the various reasons that have been suggested in explanation of the unesthetic value of the lower senses. Such factors as abundance, ecclesiastic censorship, number of qualities, sharpness of discrimination, reaction time, inertia and life-span, spatial characteristics, immediate affective value, materiality, consumption of stimulus, utilitarian function, ontogenetic and phylogenetic development, vividness of imagery, organization and systematic relations within the modality, social character, range of stimulus, perceptual value, tendency to adaptation, etc., were considered. Criticisms were offered of the theory that "the function of art is to please" and the intellectual character or "meaning" function of esthetic manipulation was emphasized.

A Practise Experiment.—M. J. VAN WAGENEN.

Table I. gives the Pearson coefficients between the work done at various parts of two practise periods and a final test period. The material consisted of a set of ten paired associates, the stimuli being the first ten letters of the alphabet arranged in chance order, the associates being the next ten letters, also arranged in chance order.

Subjects were forty university students in a class in elementary psychology, who practised two periods of thirty-two minutes each, seven hours apart, and for three minutes forty-seven hours later. The three-minute test was followed by another practise period on a set of paired associates, the stimuli consisting of the original letters arranged in a new chance order, the associates consisting of the digits 0 to 9, also arranged in chance order. The results are given in Table II.

TABLE I

Periods	Period	Minutes	Period	r
8	First	26-30	First	.780
8	First	33-37	Second	.698
8	First	58-62	Second	.515
20	First	58-62	Second	.820
20	First	65-67	Test (third)	.880 ¹

TABLE II

Period	Associates	Minutes	Period	Associates	r
First	Letter-digit	4-8	First	Letter-letter	.615 ²
First	Letter-digit	65-67	Third	Letter-letter	.531 ³

The second experiment was carried out with a group of thirty-four session university students, in which the same letter-letter associates were used as in the previous experiment, and in which the amount of work done, instead of the time, was kept constant. During the practise period 120 associations were made with each pair. Two weeks later 80 more associations were made with each pair. Before the second practise period the amount that could be recalled during 200 seconds was measured, the amount being the number of correct associates that were recalled when the stimulus letters were presented in varied order two seconds apart. The results are given in Tables III. and IV.

TABLE III

Periods	Period	Minutes	Period	r
	First	26-30	First	.727 ⁴
	First	Last five	First	.753
	First	4-8	Second	.541
	First	Last five	Second	.604
Five	First	Last five	Second	.845

Only thirty-five subjects were present for this test. The method of rank sums was used in finding this coefficient while the product-moments method was used in finding the other coefficients.

Forty-seven subjects.

Forty-four subjects.

Probably too low as the last five minutes were used in two cases where the test was finished during the 27th minute.

TABLE IV

Amount recalled.....	Shortness of first practise period.....	$r = .186$
Amount recalled.....	Amount done during minutes 4-8.....	.231
Amount recalled.....	Rate of work during last five minutes of first practise period .....	.355
Amount recalled.....	Rate of work during last five minutes of second practise period533

A. T. POFFENBERGER, JR.,
Secretary.

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REVIEWS AND ABSTRACTS OF LITERATURE

The Great Problems. BERNARDINO VARISCO. Translated by R. C. LODGE.
New York: The Macmillan Company. 1914. Pp. xi + 370.

Varisco's "Great Problems" is a vigorously written and closely reasoned book. It will be differently appraised according to the different philosophical points of view of its readers; but few will deny the soundness of Varisco's definition of philosophy (p. 4) as "the search and knowledge of the supreme truth" and the correctness of his formulation (p. 8) of its aim "to render full reason for everything."

In the first of several appendices Varisco defines his present standpoint in technical terms. "To make an indeterminate profession of idealism," he says (p. 295), "is . . . like signing a blank cheque, and I have no wish to do so." In particular, he disavows every form of idealism which leads to solipsism. But with this qualification he asserts positively "I am an idealist."

A brief outline of some of the more significant teachings of the book will define more closely Varisco's type of idealism and will also provide a basis for comment. He is first concerned to defend the possibility of philosophy, conceived as search for ultimate truth, against the "critical doctrine" that reality is unknowable. "With the assertion," he says (p. 16), "that the 'beyond' is unknowable comes the affirmation that it exists. A 'beyond' of which we know the existence is not an absolutely unknown thing—is not unknowable. . . . Positive knowledge," Varisco concludes, "contains, without doubt, the solution of the Great Problems. . . . But . . . in order that positive knowledge may lead us where we wish to go . . . we must make a well-thought-out use of it" (p. 21).

Philosophical theory, Varisco proceeds, must be based simply on facts: "We must refrain from any theory which goes beyond the fact" (p. 48). And the fact first discovered is that a body, a so-called "external reality"—an inkstand or a flower, for example—is a complex of properties, that is, of sense-perceivables. But, a sense-perceivable, as, for instance, the red color of the flower, is "numerically one" (p. 32) with a sense-percept (my sensation of redness). In a word, a body is "nothing but a group of facts

ousness" (p. 46; cf. pp. 47, 290), a "unity of sense perceivables." Relying upon this discovery of the identity of bodily property and concept is the reasoned conclusion, emphasized and reiterated by Varisco, that two subjects are conscious of identically the same sense-perceivable: Titus and Sempronius, for example, see the same color. This argument, often repeated (cf. pp. 37 ff, 227, 291-293) may best be judged from his own statements. Any other conclusion, he points out, would involve us in solipsism, and the fatal objection to solipsism is that it renders "quite impossible" the "undoubted fact of communication" (pp. 37-38). Solipsism, Varisco is at pains to show, follows not from the subjectivist doctrine that "the existence of the object consists in its having" a percept (p. 39), but from the dualistic teaching that the percept is "a modification of the subject determined in it by the action of an external cause" (p. 40). For if either hypothesis "were true, I should be absolutely enclosed within myself . . . without possible escape. In such a case no personal subject could know or suspect or suppose the existence of any other personal subject, which is contrary to the truth" (cf. p. 292). The strength of the argument lies in the words which are italicized. For the argument against solipsism is thus based not on the reasonable assumption of the existence of other selves, but rather on the undeniable awareness, whether or not an illusion (p. 51), of these other

subjects. Varisco has so far sought to establish the existence of many subjects of sense-perceivables "in common." He conceives these subjects and their sense-perceivables as "determinations of the one Being" (p. 239), as instances of a "Universal Being" which "must itself be a subject" (p. 238). The argument for this conclusion is never adequately formulated, but is implicit in the statement (p. 233): "the unity of concrete objects is implied 'from the absurd results we obtain if we assume that [they] are essentially connected.'"

The emphasized characters of this Universal Being are its fundamental unity and its observed variations. Indeed, "the variation of the universe is not in an intrinsic requirement of Being" (p. 234). The determinations of "Being," or "concrete objects," are described as relatively independent "centers of spontaneity," or monads, and are of the following kinds: (1) "common monads" (p. 241) bound together in bodies "by something other than the unity of consciousness, in substance by causal laws" (p. 241); (2) subjects (or unities of consciousness), which unify their sense-percepts, recollections, feelings and (notably) volitions (p. 241 and Chapter II.). Among subjects, the "purely animal" or "psychical" subject is sharply to be distinguished from the rational subject, the personal, or conscious I (cf. p. 241 and Chapter IV.).

The comment which follows will supplement, at certain points, this summary account of Varisco's teaching. Attention has already been drawn to the insufficiency of the argument (in the reviewer's opinion, as applied) to the existence of a Universal Being. The entire discovery of Being, in Chapter VII., suffers from a confusion of "qualita-

tive" with "numerical" identity. (The terms are not Varisco's.) Thus Varisco says (p. 239): "The monads as determinations of the one Being, are included in it. And they include it because each of them exists." The first sentence correctly states the inclusion of the monads within the One, the second incorrectly expresses the homogeneity, or qualitative identity, of the parts with the whole.

The main weakness of the book lies, however, in the reviewer's opinion, in the conventional and defective conception of consciousness. The elaboration of this criticism demands a more detailed statement of Varisco's position. In Chapter II., he sharply distinguishes the subject, or unity of consciousness, from the body or unity of sense-perceivables. The sense-perceivables are, he says, "independent" of the subject (p. 63) and may "realize" themselves "apart from any subject whatever" (p. 51). The law which unites them differs from the law which constitutes the unity of consciousness (p. 35). The subject seems to be treated, throughout the first four chapters of the book, as a sum of elements (sense-percepts, memories, feelings, and activities). Indeed, these are often referred to as "constituent" elements—for example, in the statement (p. 58): "the same sense-perceivables constitute my body and me—my body, so far as they are connected by a physiological law, me, so far as they are connected by the unity of consciousness." In later chapters, however, Varisco modifies these accounts of "subject" and of "body." On the one hand, with Chapter V., on "Values," he introduces a new view of the subject. Value exists, Varisco reiterates, only for the subject—for the satisfied and the dissatisfied and, above all, for the willing subject. "Every valuation presupposes," he says, "a volition which takes up a position and seeks satisfaction" (p. 139). The valuing self, however, can not, it now appears (p. 130), be a mere aggregate or "bundle of sense percepts and recollections, . . . variable in accordance with a certain law." Rather "it has" the percepts and recollections, "it lives," "it acts." "Sensations, representations, manifestations of activity, feelings," Varisco says (p. 152), "presuppose the subject of which they are the determinations. They would vanish if the subject vanished." This fundamental subject, however, the subject of cognition and not of mere feeling, is distinguished as personal self or "I" from the simple "animal" self, or unity of consciousness.

Along with this enriched view of the subject goes a conception of body which, as our preliminary summary has already shown, more closely allies body with the subject. Bodies, in truth, like subjects, are determinations of Universal Being. Bodies, like subjects, are centers of spontaneity, monads. The unity which binds them, the causal law, is not so different as at first appeared from logical law, the principle of the internal consistency of judgment; for causal laws too, "have their root in the unity of Being" (p. 240) which is Thought.

None the less, to the very end, Varisco retains the mythical conception of a "fact of consciousness" which is something other than a self or a self's consciousness, the self-contradicting hypothesis of an unconscious self, the belief that a monad can be "analogous to a subject," "comparable

ect," even a very simple kind of subject (p. 246) without, after being a subject. He sees clearly that the existence of anything as to consciousness, heterogeneous to consciousness, must absolutely be excluded" (p. 291), but he is blind to the fact that consciousness is as personal. He is, therefore, obliged to leave unsolved "the problem," whether Universal Being, or "the divine, . . . is or is not" (p. 268). Had Varisco fully carried through his analysis of actual experience he would have discovered that only as unity of consciousness, or self, can the Universal Being be either a subject or an object. It is relatively identical with a universe which is through and through personal.

The reader of this notice is referred to "The Great Problems" itself for a more detailed account of Varisco's doctrine—in particular for his admirable analysis in Chapter VII., of "accidentalness, however logical in itself" as the result of an intrinsic logical requirement of being" (pp. 235 ff), and his theory that evolution and change really characterize different stages of being while "the whole remains always the same in spite of the change of its parts" (p. 246).

In conclusion, a word must be said about the skill of the translator. The reader of this notice has had no chance to compare this version with the original—and has not once missed the privilege. The translator has done us the individuality of the author through the medium of a clear and spontaneous style.

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of Conduct. DURANT DRAKE. Boston: Houghton Mifflin and Company. 1914. Pp. xiii + 455.

This book makes very pleasant reading; it is widely informative; it is inspiring. If such qualities do not represent the maximum of merit in ethical text-book writing, they certainly come near it. The merits are due to a persuasive sanity eminently characteristic of Durant, to his thoughtful awareness of the multitudinous problems confronting modern civilized society, to his forceful yet unobtrusive manner of writing.

Probably the noteworthy feature of the book is its extensive treatment of present-day practical problems—problems that concern particularly American social life and hence confront the American college graduate. The limits of a review prevent any detailed consideration of the views upon the various questions which he takes up in the first half of the book devoted to "personal" and "public" morality. Greater moral problems, such subjects as smoking and intercollegiate athletics, gambling and yellow journalism, pacifism and party politics, consumers' leagues and the single tax, are all thoughtfully and ably discussed. Two chapters are deserving of special comment because they depart markedly from the procedure commonly adopted in text-

books of ethics. Chapters XVII. on Chastity and Marriage contains a franker and more thorough treatment of sex problems than I have seen in any ethical manual written in English. In Chapter XXI. on the Mechanism of Self-Control, the author refers to mind cure as an established fact, states his conviction that these psychical forces should be more generally employed in the conduct of life, and gives directions for the use of auto-suggestion in obtaining control of thought and impulse.

The least adequate portion of the book is unquestionably the one fourth dealing with ethical theory. Criticism is possibly out of place since it is evidently a prime purpose of the author to subordinate all questions of theory, particularly those of technical nature, to a study of the practical problems of morality. Doubts arise, however, as to the wisdom of such a self-imposed limitation on the part of the moralist. As helpful as such discussions of practical problems as we have in this volume undoubtedly are, we can not forget that many of these subjects are treated with greater thoroughness and precision in the special sciences of economics, sociology, politics, etc.

A "sound utilitarian or eudæmonistic theory" is the view that Professor Drake adopts and defends: the highest human good is the life that has the greatest total of happiness. The bottom fact of ethics is that different experiences bring different degrees of pleasure and pain. What makes one form of happiness more worthy than another is, in the first place, its greater keenness, or freedom from pain and, in the second place, its potentialities of future happiness or pain for self or others. We do not always act in ways calculated to bring the greatest happiness, but we ought to. Right living is therefore an art, the art of choosing in the present that object which will bring the greatest happiness in the end. Such in substance is the author's position. It has been frequently and, in my opinion, successfully assailed in ethical literature. Indeed, I think that Professor Drake who criticizes other theories rather severely should have taken the trouble to answer effectively the fundamental objections that have been brought against all forms of hedonism. He speaks disparagingly of epicureanism, yet is not epicureanism the one consistent form of hedonism? How is such a pleasure calculus as he recommends ever to lead to, or to justify, self-sacrifice and the complete devotion of an individual to a cause? He says that we must encourage men to venture, to take chances, in the service of great causes. But what justification can be found in his theory for any other course than that of careful prudence—choosing that line of action which past experience indicates will yield the greatest pleasure.

Beginning the book are five well-prepared chapters on the origin and development of morality. Skillfully the author traces the development of human conduct from the lower types of action. He does not, in my belief, emphasize sufficiently the features which distinguish human conduct from all forms of animal action. Even in custom, generalization and judgment, obligation and choice, play a part, as Wundt convincingly shows; to overlook them is to minimize and obscure the distinguishing feature of the moral life.

H. W. WRIGHT.

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Psychological Methods of Testing Intelligence. WILLIAM STERN.
 Edited by G. M. WHIPPLE. Educational Psych. Mon. No. 13.

gives here a clear and brief statement of the principles of intelligence testing. To a survey of the chief methods and results of others are added his own criticisms and suggestions for improvement in various directions. The book is prepared more especially for teachers of normal and backward children, for physicians and for others engaged in practical work with children. It falls into three parts: (I.) "Single Tests and Methods of Tests," (II.) "The Method of Age Gradation," and (III.) "Intelligence and Testing of Finer Gradations of Intelligence." Intelligence is discriminated from other mental capacities as a "general mental capacity" applicable to new problems and conditions of life." It thus differs from talent, which genius creates the new spontaneously, *i. e.*, is not limited to one kind of content, and it differs from talent in being a general capacity, while talent is an efficiency limited to one kind of content. Relative to the method of age gradation, the importance of the range of irregularities is discussed. In dealing with abnormal children the author also discusses the use of the "mental quotient," *i. e.*, the mental age divided by chronological age, as the best expression for the child's intelligence. Stern also emphasizes the need for parallel series of tests for different years. The last part of the book treats of correlations. The author approves of the principle according to which an amalgamated index secured from a group of tests is used as the index of intelligence. There are appendices and a bibliography.

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JOURNALS AND NEW BOOKS

BRITISH JOURNAL OF PSYCHOLOGY. October, 1915.
Theory of Animism (pp. 1-32): Animism originates in the belief in spirits, men, and tends to spread as the explanations of whatever had been attributed to magic. A review of the literature concerning animism, its extension to animals and plants, the evolution and history of animism is given. *The Theory of Repression in Its Relation to Memory* (pp. 33-47): ERNEST JONES.—"There exist in the mind inhibiting forces which tend to exclude from consciousness mental processes the presence of which would evoke there, either directly or through association, a feeling of 'unpleasantness.'" The theory of this theory is manifold and the subject may be divided under three heads of registration, conservation, recollection, and recognition. *Definition Vocabulary of Children* (pp. 48-51): G. H. THOMSON and J. SMITH.—"The method was similar to Kirkpatrick's; 170 samples of label words in *Chamber's Dictionary* were selected; 238 boys and girls were tested to see if they understood the words. The children were in age from 9½ through 14½ years. The difference between

boys and girls is not significant, although all the points but one on the boys' curve are above the girls' curve. *Outlines of a Method for the Quantitative Analysis of Writing Vocabularies* (pp. 52-69): G. H. THOMSON and J. R. THOMPSON. - A sampling method of estimating the size of writing vocabularies and of analyzing the vocabulary into groups of words of more or less frequent use, was employed for Dickens's "David Copperfield." It exposes the vagueness of ordinary estimates of vocabulary. *Factors in the Mental Processes of School Children* (pp. 70-92): N. CAREY. - Six groups of tests were made on four classes of girls and on a class of boys in the senior department of a London County Council elementary school. One group was for discrimination, a second for memory of sense material, the third for memory of verbal memory, fourth for school subjects, fifth for estimates of school intelligence, etc., sixth for the "general factor." All the tests for each class were intercorrelated. The correlation of the general factor with scholastic intelligence is .75 and with tactile discrimination .00; the correlations of general intelligence with other tests lie between these limits. *The Formation of Projected Visual Images by Intermittent Retinal Stimulation: II. Apparatus, Procedure and Results* (pp. 93-126): G. H. MILES. - Great individual differences exist with respect to the retino-cerebral tract as regards general sensitiveness, retentivity, and the character of the subsequent color phenomena induced by the original stimulus. A relationship appears to exist between the factors involved in the formation of the projected image and immediate visual memory. Eleven figures illustrate the apparatus used and express the results graphically. *Publications Recently Received. Proceedings of the British Psychological Society.*

Healy, William. *Honesty. Childhood and Youth Series.* Indianapolis: Bobbs-Merrill Company. 1915. Pp. 220.

Holt, Edwin B. *The Freudian Wish and Its Place in Ethics.* New York: Henry Holt and Company. 1915. Pp. vii + 212.

McTaggart, J. Ellis. *Human Immortality and Pre-Existence.* New York: Longmans, Green, and Company. 1915. Pp. vii + 119. 90 cents.

Ricklin, Franz. *Wishfulfillment and Symbolism in Fairy Tales.* Tr. by W. A. White. *Nervous and Mental Disease Monograph Series, No. 2.* New York: Nervous and Mental Disease Publishing Company. 1915. Pp. iii + 90. \$1.00.

NOTES AND NEWS

A MEETING of the Aristotelian Society was held on January 3, Dr. I. Wildon Carr, president, in the chair. Professor A. N. Whitehead read a paper on "Space, Time, and Relativity." Mathematicians have succeeded in defining diverse Euclidean measure-systems without any reference to distance. There are alternative groups of such congruent transformations of space all equally applicable, but, while the distance P_1P_2 may equal the

Q, Q, for one measure-system, it will not equal it for another. An extraordinary thing is that each of us does, as a matter of fact, determinate measure-system which remains the same, except probably very small variations, and that the measure-systems of different beings agree, within the limits of our observations. This, however, is different in regard to time. Owing to the fact that points of space are not capable of direct recognition, there is a difficulty in determining what is at rest and what is in motion, and a further difficulty of determining the uniform flow of time. If all physical influences require time for their propagation in space, the idea of an immediate presentation to the mind of the aspect of the world as it in fact is must be abandoned. What we see at any instant must, in that case, already be ancient history, with the events of the various parts hopelessly mixed. Again, if all physical influences are electro-magnetic, all influences are propagated with the velocity of light *in vacuo*. But what dynamical axes are we taking as at rest? There are two possibilities. We may assume either (a) that one set of axes is at rest, and that the others will show traces of motion in respect to the velocity of light, or (b) that the velocity of light is the same in all directions and that these be the dynamical axes assumed. The first supposition is negated by experiment, and hence we are driven to the second, which demands of us in the whole theory of relativity. If we will not have this we must reject the supposition that the velocity of light *in vacuo* is the same in all directions. This is done by assuming an ether and a correction for its modification. But as soon as the assumed ether has to be supplied with special properties to explain special experiments, its scientific value is problematical, and its philosophic use is *nil*. Philosophically relativity appears to be an ambitious attempt to give a complete explanation of the physical universe by making an elephant stand on a tortoise. Scientifically it has an adequate use by veiling the extremely abstract character of scientific generalizations under a myth, which enables our scientists to work more freely.

There will be opened in affiliation with the Carnegie Institute of Technology, Pittsburgh, on June 1, 1916, a Bureau of Salesmanship Research. A fund amounting to \$75,000 for the support of the bureau for the next five years has been provided by a group of business concerns to initiate the organization of the bureau is due. Among these contributing concerns are the Westinghouse Electric and Manufacturing Company, the H. J. Heinz Company, the Armstrong Cork Company, the Life Assurance Society, the Ford Motor Company, the Carnegie Company, and others. Offices, psychological laboratories and equipment have been provided by the Carnegie Institute of Technology. The purpose of this bureau is to secure a broader basis of established fact for use in improving present methods of selecting and training salesmen, by accumulating and systematizing information concerning the methods now used by business firms, by applying psychological tests to the analysis of the traits of successful and unsuccessful salesmen, by carrying on experiments in the selection and training of salesmen in cooperation with business firms, and by publishing the results of these studies through appro-

appropriate channels. The activities of the bureau will be guided by a scientific staff, on which Dr. W. D. Scott, professor of psychology in Northwestern University, serves as director, and Professors W. V. Bingham (Carnegie Institute of Technology), J. B. Miner (Carnegie Institute of Technology) and G. M. Whipple (University of Illinois), will serve as cooperating psychologists. The scientific staff will comprise, in addition to the foregoing, a research assistant and several research fellows. The fellowship, yielding from \$300 to \$500, will be awarded to graduate students of superior intellectual ability, personality, and leadership, who intend to fit themselves for careers as employment managers and supervisors of personnel. There will be opportunity also for students of psychology who wish to prepare doctors' dissertations in the fields of mental tests, vocational analysis, statistical method, etc. Inquiries may be addressed to W. V. Bingham, Carnegie Institute of Technology, Pittsburgh, Pennsylvania.

THE sixteenth annual meeting of The Western Philosophical Association will be held in St. Louis, Missouri, April 21 and 22, in acceptance of an invitation from the department of philosophy of Washington University. The special topic will be: "The State; Its Meaning, Its Development, and Its Possibilities." The executive committee has selected this topic as timely and fruitful in view of the international situation. It is desirable that consideration of it may follow the newer channels, so far as possible. The following amplification is given merely by way of suggestion: The place of the economic, the social, the ethical, and the religious factors in relation to the political, in the organization of the state; the nature, ground, and extent of the duties of citizenship; the meaning of patriotism; the merits of nationalism, imperialism, and internationalism; the value and limits of assimilation, internal and external; the criteria and conditions of progress, and its present obstacles; the applicability of theory to state to actual conditions. Papers (limited to twenty minutes) are invited either on the special topic or on any other subject. Titles of papers, together with brief outline, should be in the hands of the secretary not later than March 25. The sessions will probably be four in number (morning and afternoon of each day), with at least one session devoted to the special topic. The president's address will follow a dinner to be given by Washington University to members of the association on Friday evening, April 21.

BERTRAND RUSSELL has accepted a call to Harvard University. He will lecture next year on logic and ethics.

THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY

AND

SCIENTIFIC METHODS

VOL. XIII. No. 6: MARCH 16, 1916

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

RELATIVE MEMORY VALUES OF DUPLICATION AND VARIATION IN ADVERTISING

The investigation to be described in this paper is a continuation of one recently published entitled, "The Relative Importance and Frequency in Forming Associations."¹ In that paper relative memory values of a full-page advertisement shown once, a half-page shown twice, a quarter-page shown four times and an eighth-page shown eight times were determined. In all cases where an advertisement appeared more than once, exact duplicates were used.

The question then arose, which has the greater memory value, more duplications of the same advertisement, or two or more different advertisements of the same commodity, each advertisement differing from the other either in picture, or in wording, or in both? The following experiment was devised to test this point.)

Two dummies were prepared, one of which contained advertisements which when repeated were duplicates. The other consisted of different advertisements of the same commodity, but the advertisements were variations, not duplicates. The first dummy, in which duplicates were used, was made up as follows:

- 4 full-page advertisements appeared once.
- 4 full-page advertisements appeared twice.
- 4 full-page advertisements appeared 4 times.

- 4 half-page advertisements appeared once.
- 4 half-page advertisements appeared twice.
- 4 half-page advertisements appeared 4 times.

- 4 quarter-page advertisements appeared once.
- 4 quarter-page advertisements appeared twice.
- 4 quarter-page advertisements appeared 4 times.

The second dummy was made up in the same way, variations of advertisements of the same commodity being used instead of duplicates. The advertisements were all the size of those contained in the *Saturday Evening Post*. The same subjects, 40 in number, were used in both tests. It is frankly acknowledged that too few subjects were employed, but since the results agree so closely with those of others who have investigated the first part of the problem, it is believed that a publication of our findings is warranted.

Each subject was handed one of the dummies and was told to look it over at his leisure, turning each page of the advertising section. The average time taken by each subject with each dummy was about 10 minutes. After finishing with the dummy, he was instructed to write down all that he could remember about the advertisements which he had seen. One week or more afterwards, he was handed the other dummy and given the same instructions. Half of the subjects started with the dummy containing duplicates; the other half with the dummy containing variations.

RESULTS

The results obtained from the first dummy are presented in the table below. The figures show the total number of credits received by each form of presentation of the material. Since in both dummies certain advertisements were shown but once, the average of the results was used to determine the value of the advertisements shown but once:

	Once	Twice	4 Times
Quarter page.....	16	26	45
Half page.....	32	37	83
Full page.....	47	80	108

If the quarter page shown once is considered the standard of stimulation, the half page shown once and the quarter page twice represent a doubling of the stimulation. Were both repetition and increase in size of equal value, the figures for the half page appearing once and the quarter page appearing twice should be the same but they are not, indicating rather that size is a more important factor than repetition. This point will shortly be considered more in detail. Similarly, the full page shown once, the half page shown twice, and the quarter page shown four times represent four times the amount of stimulation. The full page shown twice and the half page shown four times are eight times the standard stimulus and the full page shown four times is sixteen times the standard.

If the table given above is reduced to ratios, the quarter page appearing once being taken as the standard, the following table is obtained:

	Once	Twice	4 Times
.....	1.00	1.62	2.82
.....	2.00	2.32	5.19
.....	2.94	5.00	6.76

From this table, another one is prepared, showing the effect of constantly doubling the amount of stimulation, the following is

Units of Stimulation				
1	2	4	8	16
1.00	2.00	2.94	5.00	6.76
	1.62	2.32	5.19	
		2.82		
.....1.00	1.81	2.69	5.10	6.76

ratios vary approximately as the 1.35 root of the amount of stimulus.

Differences in memory value between repetition and size are disregarded in the tables so far. The table given below shows the effect upon memory of increasing size. The quarter page, whether it is presented once, twice, or four times, is considered the standard, and the half- and full-page values are reduced to the value of the quarter page.

	Quarter	Half	Full
.....	1.00	2.00	2.94
.....	1.00	1.42	3.08
.....	1.00	1.84	2.40
.....	1.00	1.76	2.80

ratios vary approximately as the 1.3 root of the number of presentations or amount of stimulation, the 1.3 root of 1 being 1, of 2 approximately 1.70, and of 4 about 2.9.

In trying to establish correlations between these results and those of other investigators, I shall present the rest of my material. When the data are at hand, definite relations will be easier to

bring now to a consideration of the effects of frequency of presentation. If we regard one presentation of the material as the standard, we reduce the other values to ratios of it. The table showing the ratios follows:

	Once	Twice
Quarter page.....	1.00	1.63
Half page.....	1.00	1.16
Full page.....	1.00	1.70
Average.....	1.00	1.49

Here we find that the ratios vary approximately as of the number of presentations.

† The conclusion which we are forced to accept by the experiment is that size is of more importance in the of associations than repetition. This point will be considered in detail at a later period.

With the second dummy, which was made up of variations of the same commodity where repetition was the following totals were received by each of the different treatments:

	Once	Twice
Quarter page.....	16	46
Half page.....	32	86
Full page.....	47	108

Reducing this table to ratios of one presentation per page, as was done with the other dummy, we obtain

	Once	Twice
Quarter page.....	1.00	2.88
Half page.....	2.00	5.37
Full page.....	2.94	6.75

Another table, showing the effects of repeated amount of stimulation, follows:

Units of Stimulation			
1	2	4	8
1.00	2.00 2.88	2.94 5.37 5.31	6.75 7.31
Average..... 1.00	2.44	4.54	7.31

These figures do not follow an X^2 curve. But quite forcibly that variability is a more important factor than duplication in advertising.

Turning now to the consideration of the effect of the following table gives the ratios, considering the quality standard:

	Quarter	Half	Full
.....	1.00	2.00	2.94
.....	1.00	1.84	2.35
.....	1.00	1.38	1.76
.....	1.00	1.74	2.35

These figures agree fairly well with the results obtained from dummy containing duplicates, giving, however, a slightly lower for the full page. The average of the two is given below:

	Quarter	Half	Full
.....	1.00	1.76	2.80
.....	1.00	1.74	2.35
.....	1.00	1.75	2.58

A comparison of these results with those of other experiments now be made. Scott² found the following ratios, his results uncorrected for familiarity:

	Quarter	Half	Full
.....	1.00	2.32	3.74
.....	1.00	2.52	5.53
.....	1.00	2.42	4.64

His general conclusion is that there is a more than proportionate increase in memory value with increase in size of the advertisements. Starch³ gives the following figures. Where the ratios representing the memory value are uncorrected for familiarity he obtained the first set of ratios; where correction was made for familiarity he obtained the second set of values:

Quarter	Half	Full	Two Pages
1.00	2.43	5.23	6.98
1.00	1.77	3.44	4.41

Starch's results agree with Scott's in that, when uncorrected for familiarity, they show a more than proportionate increase in memory value with increase in the amount of space used. Where familiarity is allowed for, however, the ratios show a less than proportionate increase.

Strong⁴ gives the results of several experiments, showing the effect of increasing space. His ratios follow:

Scott, W. D. "The Psychology of Advertising," pages 168-169.

Starch, D. "Advertising," pages 30 and 48.

Strong, E. K. *Psychol. Rev.*, Vol. 21, pages 137 ff.

	Quarter	Half	Full
(A).....	1.00	1.41	2.15
(B).....	1.00	1.11	1.13
(C).....	1.00	2.39	3.65
(D).....	1.00	1.53	2.34
(E).....	1.00	1.66	2.41
Average.....	1.00	1.62	2.34

Strong's results indicate a less than proportionate gain in memory value with increase in size in all cases but one.

If we take the results of all of these investigations and average the ratios, it may bring out an approximate truth. In averaging the ratios, all of the experiments will be considered to be of equal value, no allowance being made for the greater number of subjects used in certain of the experiments. The ratios are given below:

	Quarter	Half	Full
Scott.....	1.00	2.32	3.74
Scott.....	1.00	2.52	5.53
Starch.....	1.00	2.43	5.23
Starch.....	1.00	1.77	3.44
Strong.....	1.00	1.41	2.15
Strong.....	1.00	1.11	1.13
Strong.....	1.00	2.39	3.65
Strong.....	1.00	1.53	2.34
Strong.....	1.00	1.66	2.41
Adams.....	1.00	1.76	2.80
Adams.....	1.00	1.74	2.35
Average.....	1.00	1.87	3.16

These ratios for the half- and full-page spaces are undoubtedly higher than they should be. For in four of Strong's experiments, in one of Starch's, and in Scott's there is little if any selection of the advertisements used. The general scheme was to use the advertising section of some current magazine as the material in the experiment. The greater familiarity of the half-page and especially of the full-page advertisements undoubtedly raised the ratios for those sizes somewhat above the normal memory value. For in advertising, as elsewhere, there is a natural selection going on, so that the full pages tend to represent those firms which have advertised successfully for some little time. The mere fact of familiarity gives to these advertisements all the value to be derived from repetition, either from duplicated advertisements, or, more probably, from varied advertisements. We shall see below that variation in the form of presentation is a very important principle in relation to memory value.

If we accept Starch's⁵ method of allowing for familiarity, we

⁵ Starch, D. "Advertising," page 34.

that the quarter page should be allowed 100 per cent., the half 73 per cent., the full page 63 per cent., and the two page 62 per cent. of the values actually received. Reducing the half-page and full-page values by these amounts in the seven experiments mentioned above, we obtain the following ratios.

	Quarter	Half	Full
.....	1.00	1.69	2.36
.....	1.00	1.84	3.50
.....	1.00	1.77	3.44
.....	1.00	.81	.71
.....	1.00	1.74	2.30
.....	1.00	1.13	1.48
.....	1.00	1.21	1.52
.....	1.00	1.46	2.20

In making the other series of experiments, in which the advertisements were selected to avoid undue familiarity, though the values are undoubtedly somewhat affected by it, we obtain the following ratios:

	Quarter	Half	Full
.....	1.00	1.41	2.15
.....	1.00	1.76	2.80
.....	1.00	1.74	2.35
.....	1.00	1.64	2.43

It should be said in explanation of the differences which exist between Strong's results and ours. In the first place, our advertisements were possibly slightly more familiar than his. In the second place, the time intervals in the two experiments were different. Strong presented his duplicated advertisements one month apart and tested a month later. In our experiment, the successive presentations of the material occurred within a space of 10 minutes and the test followed immediately after. The effect of this should raise our values somewhat,* since our averages are made from two, and four presentations of the material.

The reason for going into so much detail in connection with the effect of space is because we wish to obtain some definite data which may be used in making a comparison between the experimental results and those obtained in actual advertising business. Business returns were obtained from Shryer's "Analytical Ad-

vertising, E. K. *Psychol. Rev.*, Vol. 21, page 147, footnote.

From data now being accumulated we find that shorter intervals, as one might expect, give ratios indicating a greater effect from two or four presentations than from one.

vertising," where he shows the number of inquiries received by quarter-page, half-page, full-page, two-page, and three-page advertisements.

His results show the total number of insertions of the advertisements of each size, the total number of inquiries, the advertising cost, and the cash returns. We are interested here primarily in the average number of inquiries per insertion. Obviously, Shryer's results do not indicate the actual memory value of the advertisements, though his displays must have been remembered to a certain extent to have obtained any responses at all. Naturally, also, many persons must have remembered the advertisements who did not write to him. His book, however, is one of the few places that the writer knows of where accurate, practical data may be obtained. His figures indicate the actual efficiency of his advertisements and because of this fact, it will be instructive to include his material here. His results, reduced to ratios of the average number of inquiries per insertion, follow:

	Quarter	Half	Full	2-Page	3-Page
P. 171-5.....	1.00	1.46	2.22	—	—
P. 190.....	1.00	1.60	2.27	1.01	4.17
Average.....	1.00	1.53	2.25	1.01	4.17

The first three of these ratios are quite trustworthy, depending as they do on 109 insertions of quarter-page advertisements, 79 insertions of the half-page, and 91 insertions of the full-page. It is interesting to note that the ratios, if we except the one representing the two-page value, vary approximately as the 1.7 root of the space occupied by the advertisement. It seems probable, everything considered, that the value of space varies somewhere between the 1.35 root and the square root of the space occupied, depending upon the conditions under which the experiment is performed. The most probable value is in the neighborhood of the 1.7 root. This statement holds for both memory value and actual efficiency in pulling replies.

The problem of the frequency in insertion of the advertisement is the next one which needs discussion. A comparatively slight amount of work has been done on this point, so the facts are not so definitely known. A summary of the experiments which have been performed will disclose the available data.

Strong's^a results show the ratios for one, two, and four presenta-

^a Shryer, W. A. "Analytical Advertising," pages 171-175, 190.

^b Strong, E. K. *Psychol. Rev.*, Vol. 21, page 146.

1.00:1.25:1.62. Our results with duplicated advertisements these ratios: 1.00:1.49:2.57. The average of the two is 2.10. It will be seen that these values are somewhat those obtained for increase in size of the advertisements. It is pretty well proved, then, that size is a more important factor from the standpoint of memory than is frequency of insertion. Repeated advertisements are exact duplicates.

A comparison will again be made with the practical results which were obtained by working over the figures given by Shryer.⁹ He gave a large number of figures showing the results of consecutive insertions. The number of inquiries received from the first, second, third, up to the seventh insertion of the advertisement, are given. Since both the number of insertions of the advertisement and the resulting number of inquiries were so irregular, they were reduced to ratios and the ratios averaged. The records for repeated advertisements were not considered, for it is generally admitted that there is a considerable difference in the attitude which is taken towards the two kinds, classified and display, the former appealing primarily to those who are already interested in the position. It is rather amusing that if one takes Shryer's figures, they stand, they prove the existence of cumulative value, something which they were supposed by him to disprove.

Working out his results, the writer has added together the results of consecutive insertions of the advertisement, thus showing the cumulative number of inquiries pulled by the first insertion alone, by the first two, by the first three, etc. The figures, reduced to ratios,

	Number of Insertions						
	1	2	3	4	5	6	7
.....	1.00	2.01	3.03	4.33	5.23	6.58	7.84

These figures are to a certain extent untrustworthy and misleading. Out of the 30 or more tables from which they were derived, half contained too few figures to be entirely dependable. Tables which contained 100 inquiries or more for the first insertion were considered apart, for it was thought that the greater the number of inquiries, the less relative effect some slight accidental variation would have. The table made up of these ratios follows:

	Number of Insertions						
	1	2	3	4	5	6	7
.....	1.00	2.08	2.78	3.46	4.20	5.64	6.28

⁹ W. A. "Analytical Advertising," pages 82-114.

These figures show a lack of cumulative value, except in the case of the second insertion, and this lack is enhanced when we consider another argument of Shryer's.¹⁰ He states that an advertisement which is inserted but once will still pull inquiries during the second, third, and fourth months and backs up his statement with a list of 10 examples. The relative efficiency of an advertisement which has appeared but once is shown for the first, second, third, and fourth months in the following table of ratios:

1	2	3	4
1.00	1.68	1.83	1.91

Taking Shryer's figures as they stand, uncorrected for the piling up effects of one insertion, we find that they are somewhat higher than those obtained by the experimental method with actual rates, as will be indicated by the following table:

	1	2	3
Experimental.....	1.00	1.37	1.83
Shryer.....	1.00	2.08	2.21

If we try to correct his figures roughly by obtaining the efficiency of the repeated advertisements to the piling up of one insertion alone, we obtain the following ratios:

1	2	3
1.00	1.24	2.21

His figures, with correction, show a very close resemblance to those obtained by the experimental method.

On the average, it appears that increased space is more efficient than duplication of advertisements, with both the experimental and the practical results, as will appear from the following table:

Experiment.

	Units of Stimulation		
	1	2	3
Size.....	1.00	1.64	1.83
Duplication.....	1.00	1.37	1.83

Practical Test.

	1	2	3
Size.....	1.00	1.53	1.83
Duplication.....	1.00	1.24	1.83

The table is also interesting in that it points out the very close and striking resemblance between the laboratory tests on actual values and the business tests on practical efficiency.

¹⁰ Shryer, W. A. "Analytical Advertising," pages 114-115.

When we consider the effect of varied advertisements rather than duplicates, we find that repetition is a greater factor than increase in size, as the following table will show:

	Once	Twice	4 Times
per page.....	1.00	2.88	5.31
page.....	1.00	2.70	3.66
page.....	1.00	2.30	3.17
age.....	1.00	2.63	4.05

These ratios are considerably above those obtained for increase in size of the advertisements, which were 1.00: 1.64: 2.43.

We are also justified in stating that duplication has a much greater memory value than variation. The following table will make this clear:

	Duplication	Variation
1 appearance	1.00	1.00
2 appearances	1.49	2.63
4 appearances	2.57	4.05

This table shows very strikingly that variation possesses a very much greater memory value than duplication.

There are at least two reasons why this should be the case. In the first place, the degree of attention is undoubtedly an important factor. When we see a duplicated advertisement the second time it is relatively uninteresting, consequently the second impression is not as great as the first. But with the variation, there is always the novelty of a new advertisement so that attention may be at its maximum.

In the second place, where duplicates are used but one type of appeal can be successfully employed. This may be for the reader a relatively uninteresting one, consequently he may neglect the advertisement entirely. Where variations are used, however, it is possible to make as many different types of appeal as there are variations in the series. In addition to producing greater attention, variation is more likely to connect the advertisement with the individual's various interests, thus tending to give it a greater memory value. Since Shryer's advertisements have been running consistently in a fairly large number of magazines, it is a very probable supposition that those who answered his advertisements had been influenced by duplications and variations of the advertisements. If such is the case, and we assume it to be, it would be interesting to compare his ratios with our ratios representing an average of the tendencies. Such a comparison follows:

	Once	Twice	4 Times
Duplication.....	1.00	1.49	2.60
Variation.....	1.00	2.63	4.05
Average.....	1.00	2.06	3.33
Shryer's.....	1.00	2.08	3.46

These figures, which are strikingly similar, show a high degree of correlation between the experimental test of memory and the practical test of efficiency.

SUMMARY.

1. Increasing size gives a higher memory value than increasing the number of repetitions of an advertisement when exact duplicates are used.
2. Variation is about twice as effective as duplication.
3. There is a very close correlation between the memory value of the different forms of presentation of the material and the practical efficiency of the same forms of presentation in pulling inquiries.

HENRY F. ADAMS.

UNIVERSITY OF MICHIGAN.

THE FIELD OF LOGIC

THE volume of the "Encyclopedia of the Philosophical Sciences" recently published gives an accurate rehearsal of the present condition of the science of logic. If there is any direction in the development of logic it seems to be away from the conception of that science as a branch of psychology. Among the papers we find rather less of that peculiar psychology written in terms inherited from the scholastic logic that characterized the literature under the head of logic some years ago. The conception of logic as the science of the empirical process of thought to be dealt with through the categories of Aristotle or their scholastic modifications for a time threatened to leave no room for the traditional formal logic and its modern successor. From this departure logic has been rescued by the mathematicians. As a result of the work of Peano and his followers psychologism has gone out of fashion.

Psychologism has not disappeared from logical writing, however, and there can be found in the present volume very disconcerting traces of its survival which threaten a return. The writers of the volume have approached their task from very different points of view, but there is one respect in which they are agreed, with vary-

emphasis. Logic is still a science of thought as distinct from expression. Windleband makes it clear that this does not mean that in psychology is to be found the ground of logic. "Logic," he says, "is concerned not with the origin, but with the validity or truth of ideas." It is true that this validity is distinguished by means of feeling and that it is the task of psychology to establish "the marks which from a psychological point of view distinguished the purely theoretical grounds on which perception and knowledge are accepted from those of opinion and belief," yet, for this thinking which is directed at truth there are "constraining norms" by which we proceed from one assertion to another. These norms are not a matter for the psychologist's investigation. Logic, then, for Windleband, applies to thinking which is done under this constraint. That there exists such thought distinct from any verbal expression takes to be proved by instances of aphasia, inability to express what is in the mind, the fact that mechanical speech is sometimes accompanied by distinct thought, and, best of all, the fact that we may have in two different languages the same thought expressed. Windleband narrowly escapes, if he does escape, the clutches of the psychologists, who may claim such a thing as a "constraint" to think thus and so for their own, or may attach the "feeling" by which a true judgment is distinguished from a false. The other writers who are given place in the volume are in less danger. Professor Royce makes logic a part of a more general science of order which turns out on examination to be Russell's mathematics. These forms of order in general "are in fact the forms of all rational activity," which is again something different from verbal expression. For Croce also logic is the science of thought, the thinking process as distinguished from expression. It is to include among other things a theory of error, or the "pathology of thought." From what we had been led to expect a different attitude. Some years ago in a discussion with Poincaré he offered the suggestion that logic was not the science of thought, but the body of *rules of demonstration*. We find him in this volume, nevertheless, asserting that logic is the "normative science of the formal laws of correct thinking." It deals with the understanding, not with expression, though language offers the best example of the operation of the understanding. We find practical agreement among the writers of the volume in these two respects: (1) Thought or meaning is something completely distinct from and independent of expression. As Windleband puts it: ". . . it must, above all, be clearly laid down that the linguistic relational forms are nothing less than imitations of the forms of the movement and association of ideas," signs for sense. "The fundamental logical act, the judgment, finds its verbal

form in the proposition." (2) Logic is concerned with this inner activity that underlies expression and not with the expression: this bears the character of something accidental to the thought.

This conception of the field of logic does not prevail with the unanimity that the volume suggests. It contains two sources of confusion which have been pressed many times in recent discussion. One of these is that when we choose for the field of logic thought and not expression we are dealing with a field which is better left to the psychologists. Thought seems to be a process in time which occurs whether it is logical or not. Logic does not pretend to offer causal laws for thought and is so left to furnish normal laws—but there are grave difficulties in the way of authorizing these normal laws. Why any one should think "logically" when thinking illogically will be successful can not be made clear. To avoid the discussion of empirical thinking logicians are forced to invent a purely fictitious "rational activity" and to apply to this the laws of pure thought. The second difficulty is that if we consider thought as something over and beyond expression, something that never comes to complete expression, we have for the subject-matter of logic not merely the not-expressed, but even the non-expressible. Our data are in a form which can not be discussed, compared, described or shared.

These difficulties are to be overcome only by a radical change of attitude. Of all the writers Couturat is least involved in the course of his paper in problems of "the act of judgment," "pure rational activity," and like never-expressed, unknowable matters, and the reason is that his definition of the province of logic is only a half-hearted concession to a tradition and his real attitude is more like that of Padoa, whose symbolic logic is frankly an ideography with rules for use. In reality Couturat represents this more modern position which lacks the explicit recognition it deserves in the volume of the Encyclopedia. When it is formulated it will include at least the following two provisions: (1) The field of logic must be redefined as the structure of expression rather than thought. (2) The meaning of propositions as distinct from the propositions themselves is not (for logic) an entity independent of any particular expression, but is a function of the expression, usually indicating equivalence of two expressions or a possibility of substitution. The question, "What does this mean?" is not unanswerable, as it would be if meaning were distinct from expression, but is answerable by a second expression which can be substituted for the first. Windleband would have it that "the thought form as such never comes to expression in speech." His consequent difficulties are beautifully illustrated in his article. "If,"

says, ". . . I say of gold that it possesses the property of yellowness (which is the logical meaning of the proposition that affirms the subject 'gold' the predicate 'yellow'), so I may equally well say of yellow it is a property of gold; but verbally the conversion 'gold is yellow' to 'yellow is gold' would appear as incorrect, at least not as the exchange of subject and predicate, but only as an uncommon and inverse form of proposition." He could hardly have avoided giving verbal expression to the real logical meaning (which was never to come to expression in speech) and this choice seems to common sense to be between two differing verbal expressions rather than between a real meaning not expressed and verbal expression. Real meaning must be for logic *equivalence* of forms. In fact this is what is actually observed when logicians pretend to be dealing with "true meaning." What we are offered is an equivalent statement. When Bosanquet refers to the "true meaning" of a statement, he offers us *what he would have said* or *what he might better have been said*.

Logic in this sense will not represent the actual play of consciousness by which scientists and common men make additions to knowledge nor the path which they should follow in order to arrive at truths, but the structure of expression of truths once found. Logical laws will represent agreement as to form that must precede communication, agreement which conditions expression. The "logical act," the judgment, the actual or desirable thought process, remain a mystery to the psychologist and are barren ground for logical research. On the other hand, the rules which govern the expression of thought can be determined from expression. Logic as a descriptive and a normative science becomes possible. Geometers do not contain histories of the thinking and the motives of the geometers who discovered their theorems, but a statement of the theorems connected with the body of the science in certain set forms. We need not think in syllogisms or any other of the forms of logic. This was Mr. Schiller's contention in his "Formal Logic" and is perfectly justified. His error lies in not recognizing that communication, the sharing and storing of knowledge would be impossible except in expression, usually verbal, that is through and through formal, that possesses a definite structure. In an argument we do not reproduce our train of imagery in another's mind, nor need we try. It is sufficient to speak by the card. Discovery and proof are different matters. Logic deals with the latter, the former we may leave to psychology with the expectation of little help. Formulation of the art of thinking is not far advanced. Windleband's greatest insight is in his admission that "perceiving and knowing as empirical functions are entirely social in their na-

ture." Together with his later statement that the normative constraint of logic is felt "*as soon as an assertion is made*" the way was prepared for better things than the "purely theoretical principles," the "pure logic," the "*a priori*" laws of valid thinking with which his paper is concerned.

Such discussion of "real meanings" and "pure thought" which is "never brought to complete expression" comes from two sources. One of them is the fact of inner speech which is but rehearsed expression. The other is the desire to attribute the equivalence of varying expressions, the interchangeability of differing verbal forms, to an underlying unity of which both are "imitations" or "signs." There must be one entity which both can "copy." This motive would require a modern Hume for its complete subjugation. The "something, I know not what" that underlies expression is a thing in itself of which the logician may well beware. The discussible matter of logic seems to be confined to expression, and logic's task should be rather to examine the forms of expression for their structure, to invent new and simpler forms, to codify the relations between forms, even if this means that we surrender that mystical satisfaction that comes from the discussion of the ineffable—real meanings that are different from expressed ones.

If this view of logic is the correct one, logic ceases to be the *a priori* condition of thought and becomes the *a priori* condition of expression, but its a-priority becomes relative to its use, to the group within which it is established. Logic takes on a human character very different from the awe-inspiring divine science of order which Royce presents. We may find logics rather than logic. We can say no more than that in a certain group a certain structure of expression prevails, a certain agreement as to the use of language, and this group need not be defined by differing forms of human culture, it may be limited by the specialization of a science. The logic of mathematics consists of agreements in form of statement that would be entirely unable to deal with the uses of ordinary life. Not all human expression will submit to the rigid forms of mathematical logic whose limited number and comparatively simple and abstract character makes them so easily symbolized. Between old friends a shrug may convey an intricate and definite meaning. The logic of mathematics does not mention shrugs.

It requires a very delicate metaphysical discrimination to determine the sense in which forms of reasoning are valid for men who do not use them. A man on a desert island with a companion dog needs little of the complicated structure of the logistic. A few simple uniformities which he must observe in calling to his dog suffice. What else he has will be memories of former association

a men, or will apply to anticipated meeting with his fellows. need make no assertions. His thinking need not have the structure of logic. He needs no syllogisms with which to avoid a m or take nourishment. A feeling of hunger, the sight of food, or habits, all the stock of terms granted to the psychologist, ly to his situation. The logician must concern himself else-re.

Not only can logic include more than the logic of Aristotle, as modern logistic does, there might have been non-Aristotelian es with principles different from the familiar laws of contra- tion and excluded middle. What final authority would judge ven the ultimate "correctness" of Aristotle's logic which offers contradictories defined by the axioms: $x + x' = 1$, $x \div x' = 0$. $' = x$ and a logic which would provide three contradictories as ld the following axioms: $x + x' + x'' = 1$, $x \div x' \div x'' = 0$. $(x)' = (x')' = x''$, $(x'')' = x$? It is true that we can only discuss other es in terms of one logic, but this is no more a proof that they are therefore unreal than is the fact that an Englishman in dis- sining German must use English, a proof that English is the a *ori* condition of communication, valid for all times and all places. The principles of such logics will not imply the immutability of real, but only the comparative immutability of the terms in ch it is discussed, during the discussion.

ot only is there a divergence between the complete logic that provide for all intercourse and the limited field to which the hematician restricts himself, it is also true that this body of ract rules which is susceptible of symbolic statement may be eloped into a calculus and carried to a degree of intricacy that es all need for intercourse even between mathematicians. For- as may be constructed that can never serve, or never find in- ces of use. At this point logistic ceases to be logic and becomes e calculus, a branch of mathematics of interest only as a game. a certain extent the logistic coincides with the logic of ordinary rcourse; for some distance beyond it offers a structure for state- at and proof useful to the mathematician only; beyond that it e mathematician's amusement. The mathematical treatment of e becomes a mistreatment.

The logic of science has pretended to determine how the expan- a of scientific knowledge takes place. What it really does is to ibit the structure to which new matter must conform to be un- stood by other workers, the schemata of expression and com- munication, not the actual thought processes of investigators. We not make chemists by imparting to laymen the logic of science. have no successful formulas for discovery and invention. Col-

lege courses in logic which pretend to impart the ability to think profitably in various fields of endeavor are a snare and a delusion. Jevon's four stages of induction, like those of Enriques, and a host of others, hopelessly confuse two different matters, the thought process by which a scientist arrives at a discovery, which goes by very devious ways, and the schema by which he connects his discovery with the body of his science, the schema of proof or demonstration. This is rational. The thought process may or may not be rational. "Rational" and "logical" are best taken to their first sense in which they apply to verbal expression.

We find ourselves in entire agreement with Russell in his belief that truth is quite accidental to propositions as far as logic is concerned. Logic is not concerned with the truth or validity of ideas as Windleband would have us believe; it is rather life itself that is concerned with their truth and validity, logic with the structure of discourse and expression.

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PURPOSE AND CAUSALITY

IN Part II. of Professor Warren's "Study of Purpose,"¹ we find the statement that before Darwin's time "the only alternatives for explaining progress were 'design' and 'chance,'" but that Darwin himself "pointed out an intermediate alternative in 'natural selection.'" Later on we read, "if, through some chance variation, a peripheral organ appears in some creature, which is capable of being stimulated by the juices emanating from food, the creature possessing that variation is . . . more likely to survive and have offspring than the rest of the species."

Is there not a contradiction here? If the doctrine of natural selection includes the principle of chance variation, can natural selection logically be regarded as "an intermediate alternative" between chance and design? If variations come by chance, how is this a third alternative? Does it any more than very partially relieve the "absurdity" to which Dr. Warren refers of attributing *all* progress to "mere chance"? Natural selection may explain in a manner satisfactory to science why certain variations persist and others disappear, but it leaves the problem of the *origin* of these variations quite as much in the air as it was before.

But there is a way out of this difficulty if we define the concept of chance more carefully. The term "chance variations" should not be

¹ This JOURNAL, Vol. XIII., page 40.

strued as meaning that those variations have *no* cause, but merely that their cause is too complex to be determinable. Such a definition of chance would seem to be absolutely essential to the mechanist position.

I write these suggestions, not in defense of scientific vitalism, nor of philosophical mechanism, but of the view that mechanism is an essential standpoint of science taken in connection with the metaphysical position that the principle of causality is itself an expression of a deeper principle of teleology. The admission of an "entelgy" principle into the essentially mechanist world of science would indeed "play havoc" with the universal causal principle formulated in the interests of scientific explanation; but this does not mean that science says all there is to say in the matter of purpose. Warren's analysis of purpose on its scientific side is valuable and impressive, but the scientific aspect of purpose is after all but *one* aspect, and that an abstract and artificial one.

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REVIEWS AND ABSTRACTS OF LITERATURE

Proceedings of the Aristotelian Society. New Series, Vol. XIV, 1913-1914. London: Williams and Norgate. 1914. Pp. 438.

The first paper in this volume of the "Proceedings" is by the President, Mr. G. Dawes Hicks, and is entitled, "Appearance and Real Existence." In it the writer leads up to his own doctrine through a discussion of the topic as treated in the systems of Plato, Kant, and Hegel. These are all criticized on the ground that empirical things are assigned to the realm of phenomena or appearances. According to the view advanced by Mr. Hicks, objects are not appearances in the usual sense, but appearances are rather the ways in which objects are apprehended. The common notion that objects of immediate experience are sense-data, which by their presence enable us to lay hold of objects more remote, is contrary to fact. What we perceive is the physical object, though this perceiving is indeed mediated or made possible by the sense-data or "presentations." These data are not immediately apprehended; "their influence is largely indirect and in the region of obscure consciousness" (p. 36). Objects are not immediately apprehended and apprehended as they are, though our apprehension is indeed incomplete. "It is precisely in this contrast between the imperfect, the partial, and the perfect, the complete, that the significance of the term 'appearance' is to be discerned" (p. 39). It is immediately added, however, that "incompleteness may often amount to positive error." Apparently the significance of this transformation from mere negation or incompleteness to "positive error" escapes the writer, for his explanation of illusions, such as the bent stick, consists simply

in showing that "the distinction between appearance and reality is necessitated by objective conditions" (p. 41). Instead of showing how a bent stick results from a partial or incomplete perception of a straight stick, the explanation devotes itself to considerations of perspective, diffraction, etc., which are entirely irrelevant to the question at issue. Whatever the reason for the appearance of the stick, the difference between the perceived stick and the "real" stick is hardly a difference of mere omission. Much of the discussion is evidence that the writer is unable to shake off the bondage of an outworn psychology. In discussing memory and imagination, for example, he protests with some feeling against the notion that the mind is a storehouse for the materials required for the construction of objects, yet he hospitably shelters the presentations which "do duty merely as signs" of objects. That the two cases are essentially parallel does not seem to occur to him, and, in his own language, "the assumption would be less readily made if the question of what it implies were not so lightly passed over" (p. 45). It is held both that "we do not start with the apprehension of innumerable patches of color, etc." (p. 37), and also that "it is psychologically demonstrable that what appears to be the immediate apprehension of distance is in truth a complex estimate based upon a number of data and is essentially of the character of a judgment" (p. 36). Sensation, in other words, is an abstraction, an achievement, which comes relatively late, but it is also a starting-point, a constituent, or datum. Fundamentally the trouble seems to lie in the assumption of "what certainly seems to be an empirically established fact, that a finite mind is a real entity in the midst of a vast environment of other minds and of physical objects" (p. 39).

The second paper, entitled, "On Feeling," by Mr. J. A. Smith, opens with a critical discussion of various theories regarding the nature of feeling, and then proceeds, dialectically, to the conclusion that "*all* experience, so far forth as it is experience, or in proportion to its perfection as experience, is Feeling and *therefore* Pleasant Feeling or *Pleasure*. And, conversely, that so far as any experience is short of perfect experience, it is by comparison non-feeling and *therefore* unpleasant Feeling or Pain. This involves the paradox that Pleasure is Feeling, and Pain not Feeling, but its opposite, and therefore Pain has, as compared with Pleasure, only a secondary or borrowed existence. It exists only in so far as non-experience or inexperience can be said to exist. Pleasure is positive, Pain negative, a contrast or shadow effect. Or, as I should prefer to put it, Pleasure *is* and *is* something, while Pain is not or is nothing" (p. 72). This conclusion is based on a wearisome process of logic-chopping, with the inevitable assumptions and ambiguities that have made philosophy so often a battle of words.

The paper on "William of Ockham," by Mr. C. Delisle Burns, aims to show, in the first place, that Ockham "regarded the individual Socrates as objective fact, and, seeing that it did not *consist* of qualities, supposed the likeness between Socrates and Plato, etc., to be '*intentiones mentis*,' 'abstract ideas'; but he avoided the statement that these 'ideas' or classifications are arbitrary. And again this, though inexact, prac-

y amounts to the admission of an irreducible reality, a universal" (p. 90). The conclusion arrived at is that "we must accept, as the basis for understanding the particular, *numerical difference*; and as a basis for understanding the universal, existence which is not reality, or the terms are preferable, at least *two kinds of reality*" (p. 99). This conclusion, however, is simply a demand that must be met by our expectations. How this is to be accomplished, or what new modes of apprehension are possible, the writer does not undertake to say.

"Philosophy as the Coordination of Science," by Mr. H. S. Shelton, advances the thesis, "that the coordination of the facts and theories of science is a branch of philosophy and that this coordination should not be a shadow, but a solid reality" (p. 100). Intensive work in different fields has become so common that some means of coordination has become indispensable, and this is the task of what the writer calls "objective philosophy." Various illustrations are given to show the practical value of this work. "In some small way to correct the modern tendency towards specialisation, to preserve that wider view which tends to be lost in the increasing mass of detailed work, to distinguish between the facts of science and his theories and opinions, to endeavor to ascertain which of the latter are sufficiently well established to be transferred to other fields of thought, and which are allowable only as working hypotheses confined to the circle of ideas whence they arise, to separate the scientific trend of human thought, research and endeavor from those personal sectional excrescences with which they are bound up, these are a few of the aims of objective philosophy" (p. 123).

"Intuitionism," by Mr. N. O. Lossky (translated from the Russian), analyzes experience as including "(1) the self, (2) a content (a 'something'), (3) a relation of having between the self and the content" (p. 124). Subject and object are coordinate, the relation being of a non-subordinate sort. The usual argument for subjectivism is met by the suggestion that some of our experiences "might be states of some centers of the nervous system," in which case they are not mental states, but "would still belong to the sphere of the not-self" (p. 132). It is true, indeed, that every act of knowledge must contain a certain element of subjectivity, but this can be separated out, for truth bears certain marks. If, for example, we add imaginative elements to a situation presented by memory, the difference is directly and easily perceived. Judgment the content is objective and springs from the nature of the objects known if the predicate (or the conclusion) "follows from the objective content of the subject (or the premises) without any intervention on the part of the knowing mind. All that is left for the individual is simply to follow what the content of the subject compels him to admit" (p. 150).

Under the title, "Some New Encyclopedists on Logic," Mr. J. Brough offers a review of the forthcoming Encyclopedia of Philosophy. This is followed by a "Discussion on the Value of Logic," which consists of a response by Mr. A. Wolf against the criticisms advanced in Mr. F. C. S. Schiller's "Formal Logic," and a reply by the latter. In his handling

of this topic Mr. Wolf unfortunately does not concern himself seriously with the specific charges brought by Mr. Schiller, his discussion showing considerably more animus than relevancy. This is the more regrettable because a detailed consideration of these charges would be especially opportune. Such a consideration would doubtless be welcomed by many teachers of logic who are apparently growing more and more distrustful of the traditional treatment, but who are not ready to take the radical position defended by Mr. Schiller.

"The Psychology of Dissociated Personality," by Mr. W. Leslie Mackenzie, confines itself to "terms and doctrines where 'criticism of categories' ought to be of service" (p. 243). The discussion of personality, the formation of double personality, the unity of consciousness, the subconscious, and the mechanism of dissociation is intended to eliminate as far as possible all empty and unintelligible concepts, in order to limit the study of dissociated personality to concepts and facts that can be experimentally verified and analytically described.

The paper by Miss F. R. Shields is a defense of "The Notion of a Common Good." The judgment that the Good is common, so it is argued, is "an analytic proposition. If there be such a thing as Good at all, it must be recognizable as such to all rational individuals; just as the notion of Truth means what is true for all, whatever the content may be, so the notion of Good means *common good*" (p. 274). The contrary belief arises partly from the mistaken notion that the good of different individuals is conflicting, and partly in confusing the proposition that the good is common with the proposition that whatever is, is right. These views are erroneous, as is also the opinion that the common good is the goal and not in any sense the presupposition of ethical endeavor. Whenever interests conflict, the good is equally good for all concerned,—why or how is not stated, save that this is involved in the "logical" or "formal" characteristic of the good. How the good is related to the lives and activities of men is not made clear, and it is difficult to suppress the suspicion that the discussion is concerned with the fruitless manipulation of an abstraction and not with a dynamic and authoritative ideal.

Mr. David Morrison's paper on "The Treatment of History by Philosophers" opens up with the apparent conflict between determination by personal agency and determination by universal law. Freedom and the reality of time are questions that must be faced by the philosophy of history. To deny the reality of time is to discount the individual and his experiences, and in the end it wrecks all human purposes. Given the reality of time, however, it is still requisite to provide for the conservation of values, and this conservation seems to be bound up with the persistence of personality, both finite and infinite. The problems with which history presents philosophy all lead back ultimately to the contest "between spontaneity or individual activity and the scientific concept of inert matter as a constant quantity" (p. 316). The writer, however, does not seem to feel that an investigation into the nature of values and their

to human conduct is likewise necessary to legitimate his conclusions as to what is necessary to give dignity and worth to history. The thesis of Mr. S. Alexander's paper on "Freedom" is "that Freedom enjoyed determination; and that it is found wherever the distinction of enjoyment and contemplation is found; so that human freedom is but a particular case of something much more general" (p. 322). Freedom, for example, even in instinctive processes, where one state leads on to another; or in what we call the free play of the imagination, one fancy suggesting another," without the presence of involution. Acts of volition are simply one kind of freedom. Seen without, such processes do indeed have the character of determination. But "freedom in general is the experience which each thing has of working of its own nature; and a distinction parallel to ours of freedom and unfreedom exists for the plant and for the stone or the stone. The plant undergoes the wind which bends it, or the air which is respiration at work. But it enjoys its own free act of respiration. The stone is passive to the freezing water that splits it, but free in its resistance to deformation" (p. 352). This view of freedom, as is explained in some detail, does not involve the abolition of temporal distinction nor does it deny causality to mind or make mental facts wholly pre-determined. Causation presents essentially the same features on the mental side as on the physical side; and predictability has the same kind of limitation on the physical as in the psychical realm. In the discussion of freedom, which is confessedly "brief and vague," it appears that in acting on the expectation or anticipation of future consequences leads to their fruition, i. e., such expectations are operative in the determination of events (p. 339, note). For other modes of conscious behavior, however, no corresponding differentia is indicated, with the result that all the familiar difficulties and obscurities regarding psychical causation remain pretty much as they were. Mr. Alexander's suggestive paper is apparently too much concerned to show that freedom, being "nothing but the termination or causality in enjoyment" is "in no wise different from the familiar causality of the physical world" (p. 329). The reviewer ventures to suggest that unless some new category is employed which is able to differentiate conscious or intelligent behavior from other categories, the problem of freedom offers little hope of solution. The suggestion, for example, that is made regarding the *modus operandi* of volition, acts may perhaps be fruitfully applied to all forms of conscious behavior. A more thoroughgoing analysis of conscious behavior seems to be demanded for a consistent and illuminating doctrine of freedom. The Symposium on "The Status of Sense-Data," by Messrs. G. E. Hughes and G. F. Stout, is a careful and excellent discussion. The points of agreement between the two writers are stated by Mr. Stout as follows: (1) "The sensibles which we directly apprehend in perceiving a physical object are never simply identical with the physical object itself or with any physical part of it or with any quality belonging to it"; (2) "What we know through sense-perception of a physical object is based in the first sort on the direct apprehension of sensibles and the perception of

relations between directly apprehended sensibles (p. 381). Both hold that we have direct knowledge of "sensibles" or sense-data as connected with existence beyond themselves. The source of the sensibles is known as like in nature to the nature of the sensible. According to Mr. Moore, however, this kinship of nature holds only for the "primary qualities" whereas Mr. Stout thinks that it is true of all sensibles without restriction. The question, raised by Mr. Moore, how we can know the source beyond the sensibles, can be answered, according to Mr. Stout, by reference to the parallel case of recollection, in which images know or refer to the earlier experiences from which they were derived. Here also we have an immediate knowledge of a source that lies beyond the present experience. What we have in such cases is the "unanalyzed complex including image and primary experience and their connection, without separate discrimination of these factors" (p. 387). To make the discrimination is to correct the errors of illusions and hallucinations. As to objects existing unperceived, it is sufficient to assume that the source of our sensibles persists, together with the possibility of such sensibles, the possibility being "of such a nature that its realization does not affect existence or nature of the source" (p. 403). This relation to sense-perception must be included or the physical object is no physical object at all.

In this presentation the relation of the mind to its object seems fortunately, to be passed over all too lightly. The theory must show that the relation is presupposed between the mind and its object or else lay open to the suspicion that this relation of "immediate knowledge" cannot be made intelligible. The difficulties that have so long infested the concept of reference can hardly be eliminated by citing facts and the indubitably cases of legitimate reference. And, secondly, the attempt to solve the problem of perception and of relativity by including with the object the possibility of perception or reference to sense-organs does not, after all, advance us a great deal. "Possibility" is only a word. We cannot conceive of objects that are in nowise affected by the fact that they are perceived, the nature of perception and of relativity would still be past finding out.

The concluding paper of the volume, by Mr. H. Wildon Carr, is titled, "The Principle of Relativity." The purpose of this paper is to discuss the philosophic import of those recent speculations in the physical sciences known as the doctrine of relativity. These speculations, according to the writer, raise three philosophic problems, viz., the problem of continuity, the problem of the nature of real duration, and the problem of original movement. These problems are discussed and solved along orthodox Bergsonian lines. Matter being the externalization of energy in action, is inherently discrete; hence continuity must be something that is essentially concrete and qualitative, that is, life. "Similarity" becomes concrete and continuous when regarded as pure duration, not as merely geometrical time. And, lastly, "life is a movement, a change, or duration which is not a quantity; it is not an aggregate; it is not divisible into parts external to one another; it is a pure qua-

physical world is the reflection outwards of what in itself, in its ab-
e nature, is psychical duration" (424).

he volume as a whole shows the range of subjects and standpoints
have marked earlier volumes of the "Proceedings." Generally
ing, it presents no striking novelties in the way of ideas, but it
ets the different systems and doctrines that during the past decade
been struggling for supremacy in the philosophic world.

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Analysis of Sensations. ERNST MACH. Chicago and London: Open
ourt Publishing Company. 1914. Pp. xvi + 380.

ach's small work on the "Analysis of Sensations" is too well known
all for a detailed review. A new English edition of it has recently
from the Open Court Publishing Company, revised and supplemented
the fifth German edition. Since the first appearance of the *Contribu-*
ons in 1886 and the first English translation in 1897, great changes
come about in psychological epistemology, which are reflected in the
nt volume. The editor of the present revised edition, Mr. Sydney
rlow, informs us that "six chapters are entirely new, namely, Chap-
II., on 'My Relation to Richard Avenarius and other Thinkers';
ter V., on 'Physics and Biology: Causality and Teleology'; Chapter
, on 'The Will'; Chapter IX., on 'Biological-teleological Considera-
as to Space'; Chapter XI., on 'Sensation, Memory, and Associa-
'; and Chapter XV., on 'How My Views Have Been Received.'"
her, the eight chapters of the original edition have all been greatly
nded. Chapter II. now contains most of the matter which appeared
appendix to the translation of 1897. Chapter VII. contains six sec-
by Dr. Josef Pollak on recent research as to the functions of the
nith of the ear.

y no means the least interesting and encouraging part of the book is
eries of prefaces accompanying the various German editions, from
rst to the fifth, in which the reader may perceive how the work has
ily made its way and how epistemological opposition has steadily
ened. "Whether I shall ever succeed in making my fundamental
plausible to philosophers, I must leave time to decide," says Mach
e chapter, "How My Views Have Been Received." Time has prob-
been more friendly to Professor Mach's opinions than the author had
e time much reason to expect.

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COLUMBIA UNIVERSITY.

JOURNALS AND NEW BOOKS

MIND. October, 1915. *Nietzsche on the Problem of Reality* (pp. 441-463): W. M. SALTER. — Summarizes Nietzsche's teaching of the problem of reality as follows: (1) The world (the world as we commonly understand it) is not real—the world of "science" as little as that of common sense; (2) we make the world real, i. e., posit it as such, have faith in it for life, and none the less delude ourselves; (3) is there any reality? (4) reality conceived as power and will to power. *What do We Mean by Reality?* (pp. 464-480): C. D. BROAD. — "Subject to the conditions that space is to be changeless and homogeneous and not to act on matter, and that matter is to move about in space, can we construct a system of physics which assumes Euclidean geometry for space and enables us to deal consistently and adequately with all the data that scientists agree to be most worthy to be taken into account?" *Lotze's Relation to Idealism. Section 3* (pp. 481-497): E. E. THOMAS. — According to Lotze, "what renders the world a whole is an order of validity." In addition to the "unity of order" there is a "unity of existence." "To make the unity of order prior to that of existence, is to return to Idealism; to make the unity of existence prior to that of order, is to move away from Idealism." *The Relation of Idea to Object-matter as a Universal Mode of Cognition* (pp. 498-515): CHARLES E. HOOPER. — "The relation of thought to object-matter from which it consciously detaches itself is, in my view, a universal and self-evident mode of human cognition." "The logical form of thinking conditions the matter of thinking but does not refer to anything outside itself. It is the matter of thinking which always refers to a quite different matter thought about." *Discussions: Realism, Pragmatism, and William James*: F. C. S. SCHILLER. *The Necessity for a Universal in Reasoning*: H. S. SHELTON. *Mr. Strachey's Defense of Mr. Russell's Theory*: J. E. TURNER. *The A Priori Argument*: W. A. PICKARD-CAMBRIDGE. *The Indetermination of Meanings*: F. C. S. SCHILLER. *Critical Notes. New Books. Philosophical Periodicals. Notes.*

- Calkins, Mary Whiton. *The Self in Scientific Psychology*. Reprinted from *American Journal of Psychology*, October, 1915. Pp. 495-511.
- Cannon, Walter B. *Bodily Changes in Pain, Hunger, Fear, and Rage*. New York and London. D. Appleton and Company. 1915. Pp. xiii + 311. \$2.00.
- Chidley, W. J. *The Answer*. Sydney, Australia: Sydney D. Smith. 1915. Pp. 205.
- Davies, Arthur Ernest. *A Text-book of Logic*. Columbus, Ohio. R. Adams and Company. 1915. Pp. xxviii + 601.

NOTES AND NEWS

A WORK OF RECONSTRUCTION

THE Belgian Scholarship Committee was founded about a year ago in Washington by the well-known author, scientist, and traveller, Dr. Nevil Martin Hopkins. At first it confined its activities to the District of Columbia, and its aim was simply to collect money for destitute scholars, but its scope has become broader and broader. The committee now includes among its members the presidents or chancellors of the following universities: Johns Hopkins, Princeton, Michigan, Missouri, Leland Stanford, Pennsylvania, George Washington, State of New York, Nebraska—and many other leading men of this country. The aims of the Belgian Scholarship Committee are the following:

1. To give to the Belgian scholars, writers, and artists a chance to resume their work of art or science. To accomplish this aim the Belgian Scholarship Committee acts as a clearing bureau between the American universities, and other educational institutions, and the Belgian victims of the war.

2. To raise a fund for the reconstruction of a new and better Belgium, especially in the educational field.

The first aim is only of a temporary nature; the second one becomes every day more important. Our ambition is to be ready, as soon as the war is over, to help in putting Belgium on her feet again for a new and brighter career. We are appealing for books to the American libraries; we hope that they will be willing to give some of their duplicate copies and so that we shall receive free sets of their publications from the educational institutions and learned societies. We can not afford to store and keep the books until the end of the war. Therefore, we do not ask for books, but rather for promises of books. We suggest that the whole business be managed in the following way: Each library would simply send a list of the books that it is willing to give to Belgium. This list would contain all bibliographical information that is necessary to identify the books without mistake (author, title, number of volumes, date and place of publication, editor). We should acknowledge receipt of these lists, and enter them on a duplicate list on cards. After the war, as soon as circumstances permit, the Belgian Scholarship Committee would write a letter to all the libraries, recalling their promise, and asking them to send the books to some central storehouse in New York City, from where they could easily be shipped to Belgium. We shall concentrate our efforts on the making up of a collection of American books—books published in America, or relating to American affairs. We should thus be able to offer to Belgium, soon after the war, an *American* library. No gift would be more appreciated and would do more to bring about a better understanding of American conditions and ideals, and greater international friendship. Of course books given by publishers and authors will also be welcome. We would suggest leaving in each book its former *ex libris*, a short note being added to show how and when the transfer to Belgium was

made. Dedications by the authors would be also much appreciated. The value of the collection would be in this way considerably increased. It would really constitute a lasting souvenir of America's generosity and sympathy.

We are also appealing for money. Money is needed to help Belgian scholars and artists; money is needed to carry on our activities; lastly, we must be able to remit a huge reconstruction fund (to be used for educational purposes only) to the Belgian people when the war is over. We can not expect to be helped by the general public, as is the case with the general relief fund, but we earnestly appeal to the élite of the American people—to those who are especially interested in the development and diffusion of knowledge and art. The best way to show one's sympathy is to become a Fellow or Member of the Belgian Scholarship Fund for the duration of the war and two years thereafter. The Associate members agree to subscribe at least Ten Dollars a year; the Sustaining members at least One Hundred, and the Fellows One Thousand. Please draw checks to the order of John Joy Edson, Treasurer, and send them to the Belgian Scholarship Committee, 309 Wilkins Building, Washington, D. C. When the war is over the Belgian Scholarship Committee will publish a book containing a complete record of its activities and a list of the Fellows and Members whose devotion made it possible.

We wish to lay stress upon the fact that ours is not simply a relief work; it is essentially a work of reconstruction, making for international friendship and peace.

GEORGE SARTON, D.Sc.,
Secretary of the Committee.

UNIVERSITY OF GHENT, BELGIUM.

THE Section of Anthropology and Psychology of the New York Academy of Sciences met in conjunction with the New York Branch of the American Psychological Association, at Columbia University, on February 28. The following papers were read: "Tests of Manual Accuracy in Pre-Vocational School Boys," Mr. R. L. Gould; "Association and Classification," Dr. G. C. Myers; "Tests of the Memory of School Children," Miss E. F. Mulhall; "An Experiment in the Learning Process," Dr. C. L. Robbins; "Tests of Mechanical Ability," Mr. J. L. Stenquist.

PROFESSOR WILLIAM STERN, of Breslau, has received a call from Hamburg to fill the chair of philosophy and psychology vacant by the death of Professor Ernst Meumann.

PROFESSOR LAWRENCE J. HENDERSON has been giving a course of five public lectures, at Harvard University, on "Teleology and Natural Science."

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

A STATEMENT OF EPISTEMOLOGICAL DUALISM

THE fundamental distinctions which I think it desirable to make at the start are between the content of knowledge, the object of knowledge, and the psychological existence of the knowledge act. The hardest thing, of the three, to make clear in language is the first; but if one will take the matter simply enough, the meaning should not be particularly ambiguous. What is intended is that abstract articulation of the content of the judgment which the proposition represents, as this can be distinguished alike from the judgment as a psychological fact occurring in time, and the thing, or actually existing reality, to which the judgment is intended to refer. Thus when I say, This is a green apple, there is, we ordinarily agree, a definite mental process taking place "in my mind," which the psychologist presumably could describe. It occurs at a given moment, occupies a specific duration, is preceded by a certain other, and succeeded by still a third, psychical process, and has describable peculiarities of sensation and imagery. On the other hand there is the real apple, an object in the physical universe, which, so our ordinary judgment runs, existed prior to any thought of ours about it, is unaffected now by our thinking—unless indeed we are led by the thought to come into some physical relationship to it,—and goes on the even tenor of its way after we have passed by and forgotten all about it. Now the *content* of our thought is distinguishable from both of these, although in close relationship to both. It is the descriptive side of the nature or characteristics of this object, an abstract and representative summing up of the qualities and relationships which coexist in it. In this way it is a rather elusive sort of thing; psychology has had a good deal of trouble in placing and giving an account of it. It somehow applies to the object, is true of it; but in itself it is a bundle of abstractions, each element capable of being represented by a word, and is **not** fixed in any spatial location as physical objects are. And furthermore the content, as content, or as product of the activity of judgment, is not to be confused with its own psycho-

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logical existence as bare mental fact or stuff. It is, to be sure, somehow embedded in the concrete mental process. If the latter ceases, then the thought with its content also ceases. There can be no content without psychological embodiment, no thought without thinking; all that then would be left would be the real apple. But nevertheless when I am thinking about the content as the result of an act of judgment, my thought has shifted from the content as the psychologist analyzes it in factual terms. Each element in it has indeed a factual side; but I am regarding this now not in its isolation as an existent, but as a connected meaning. The content as such is not only abstract in the sense that it is unlocalized in space; it is unlocalized also in time. Every psychological existence takes place at a specific time in the stream of experience; the content of truth, as the product of an abstracting act, is timeless.

Now it is not strange that a fact of so peculiar a sort should have played a large rôle in philosophy. To my own notion, it has indeed been in a special sense the *ignis fatuus* of the philosopher. Himself occupied primarily with thought, he has had an irresistible tendency to suppose that intellectual content, freed from all limitations of time and space, and from the peculiarities of individual knowers, is all that reality connotes—a thing especially easy since all that we can possibly say about reality must be put in terms of intellectual content. Most historic rationalisms and absolutisms have been of this description. It is for this reason that it is so extremely difficult for an opponent to come to terms with a philosophy, for example, like the neo-rationalism of the successors of Kant. If by a certain form of words I have in mind a description of actually existing things and persons, and my opponent means instead the timeless content which my words presuppose, with the individual reference dropped, then while there is enough community between our thoughts—the content is the same—to mislead us into supposing that we are talking about the same thing, the actual reference of our thought is different, and endless confusion is bound to result. That the new realists, in their doctrine of subsistence, have not been free from the same leaning, I think is probable; indeed they are showing some tendency, even, to let existence shift for itself altogether as hardly worthy the philosopher's attention, and actually to substitute definitions for things. How powerful the temptation is, is indicated by the fact that even pragmatism does not appear to have escaped it. In subordinating thought to thinking, pragmatism might seem to be on the way to getting rid of the deification of the thought content. The content of thought presents itself now not as the goal of philosophic endeavor, but as a stage in action, and a

tical help in solving its problems. But what if this means, not overcoming of the fundamental vice of hypostasizing content, but only a different character assigned to content, which merely postpones the abstraction one step further? what if it is simply changing the nature of the content from static to dynamic, from thought to thinking and acting? When we find the abstract term "thought," as a definition of reality, merely changed to the equally abstract term "experience," when we find the reference of thought to an object repudiated as strongly as by the absolutist, and the "object" turned into a stage in the development of action, while "consciousness," again, equally disappears as a concretion, and is replaced by a scientific description of operations or activities, it would seem that pragmatism is also following the popular path in philosophy, and that when it has got what seems to it an adequate description of reality, is refusing to go beyond this description, and to admit realities which indeed are as described, but which also have an independent existence apart from the terms of the description.

Now in opposition to this, I am assuming that when we have completely envisaged an intellectual content—not some of them, but any and every intellectual content—we still have left out two fundamental points in the situation, two objects of belief, which common sense demands. Both of these agree in one respect. They presuppose, that is, the notion of existences, or entities, or stuff, in our account of reality. The denial of this is of course a necessary incident in the content theory of reality; but it clearly has, and has always had itself with, the strong prejudices of the non-philosophic mind to contend against. To the best of my belief, the popular opinion is right here, and the philosophic tradition wrong. For certain practical purposes we can substitute descriptions for existences; but a philosophical account of truth is not one of these. I confess I find myself somewhat at a loss to enforce this against a hostile opinion; but I can simply appeal to an expugnable belief when we come to stand before the presence of the facts. Consider the physical world. It is almost commonplace nowadays with an influential group of thinkers, that reality is no more than a formula, and a thing no more than a law. It is hard to eradicate this opinion, partly because, for the special purposes of the scientist, energy is a formula. His whole aim is to reduce it to a shape that can be set down in a book, and used in calculations. And he has accordingly an inveterate disposition to think that when this is questioned as an ultimate fact, the objector is merely trying to reintroduce mystical and incalculable elements into science. But it ought not to be impossible to take a point of view outside the specific scientific interest; and if one will take this in

imagination, then it is not difficult to bring things at least to an issue. And if one can think himself engaged in an active struggle with any of the great forces of nature—battling, we will say, with a tornado or a raging torrent—and still genuinely confine his belief in nature to a set of equations, if he can resist the *practical* persuasion that there are real things and real forces that are existences beyond him; and that set active limits to his self-assertive will, then the only thing to be said is that one has come to a branching of the ways. Of course I do not deny that the thing can be done, and that from his vantage-point the philosopher may be able to look down upon the naïve and foolish superstition he has abandoned. I only confess that I can not manage it; and in this I am pretty well assured that I should represent the general judgment of mankind.

The other case, that of psychological or conscious stuff, stands on a somewhat different basis. But here also I know of no way to meet the claim that consciousness is just a relationship, or a function, or whatever it may be called, except by putting oneself in a certain situation, and noting what impression it makes upon one, in what state of belief it leaves him. And the situation is, again, not that of the scientific psychologist attempting to set forth the laws of his science, but that of the plain human being. Consider, then, the experience of having a vivid color sensation or a hard toothache, or a compelling emotion. That there is existence here, stuff, brute fact that can not be resolved into relations or activities or any of the philosophical devices for avoiding ultimates, is to me a result from which I can not get away. I recognize, I may add, that this statement fails to set forth any clear ground of opposition to that special doctrine of consciousness which, if I understand them, the new realists have advanced, and to which I do not profess here to be making any adequate reply. At present all I wish to make clear is the nature of my belief that there is real stuff there; and that in some instances, at any rate, we can avoid calling this *conscious* stuff only at the risk of breaking with common sense. For while it is possible, though I do not concede this to be the fact, that common sense might accept the claim that the stuff is a neutral entity color, and that it is only the relationship to my organism which leads me to speak of it as *conscious* color, it certainly would reject this explanation where pain and fear are concerned. I shall, therefore, assume as my starting-point the traditional position of the classical psychology—taken as self-evident till recently—that there are in the universe such things as streams of conscious psychological experience, ultimate fact-stuff, which we can be so sure of that the evidence for other reality even suffers in comparison.

What then I interpret, in large terms, as the common-sense belief, is as follows:¹ There exist, in the sense of the traditional philosophy of empiricism, streams of conscious experience which, by direct introspection primarily, we can analyze and to an extent describe, though the meaning of the words in this description can only be realized as each man is able to verify in his own experience that to which they are intended to point. For purposes of description, what is most accessible are the conscious elements of the sensation psychology. Apart, however, from these elements within experience, there are also to be distinguished certain active attitudes into which the elements enter; what these are, again, can only be verified by referring to experience itself. Among these is the act of judging, or connecting the elements in certain specified ways. So connected, they form what I have been calling intellectual content. Since the act of connection is something over and above the elements connected by that act, the knowledge content can not be analyzed into mere isolated bits of conscious stuff. It can be *analyzed*, provided we do not forget the act of synthesis itself as a part of our analysis; but synthesis, by definition, can not be itself only a new bit of psychological stuff, else it could not do what we are assuming it does do—connecting the other elements together; it would be simply one more grain added to an amorphous pile. And it is just the character of the act of judgment that it gives to the content, in its connection, a timeless and abstract character, as distinct from its mere existence as a part of the temporal conscious process. The elements, as elements, are incidents in this stream, as also is the act of judgment as a special psychological act; but the result of the act, or knowledge, has a timeless character, and not an event at all. And now, furthermore, it is normally a function of the act of judgment that it should not only connect these elements, but that it should refer the connection, or the connected content, beyond itself to an object, or to reality. Concretely, when I say, This is a green apple, there is a certain timeless character which I assert belongs to a real object in the phys-

¹ The need of *starting* with the common sense point of view is an assumption of method which I do not stop to justify at length. It is to my mind peculiar in philosophy to ignore the situation as men would ordinarily accept and to carry on discussion within the confines of a reasoned point of view different from that of the pre-metaphysical human stage. If one is going to convert this in the end, he has of course a perfect right to make the attempt; but not to slur over the discrepancy, and fail to begin with the common use of language, from which then the more sophisticated use is plainly differentiated, so as to give the reader no way to orient himself, to introduce needless confusion, or to confine the philosopher's influence at any rate to the circles of the *minuti*. The only real matter that I regard as relevant here, is whether I myself have interpreted the universal mind correctly. I shall come presently to criticisms of this interpretation.

ical world, through an act of judgment which is an incident in a process of psychological experience which I call my conscious life. I hold that this represents a statement that the common man would readily accede to if he could be made to understand it, and that, accordingly, unless there are fatal difficulties attaching to it, it has the philosophical right of way.

In such a statement, we have the natural suggestion of a definition of truth; and it is, I think, identical with the definition which common sense would be most likely to accept. The judgment is *true*, namely, when the character or content which is assigned to the object actually belongs to it; otherwise it is false. This is a definition which, I have ventured to hold, appears perfectly simple and satisfactory to the common man; but with philosophers it is distinctly under a cloud. Everywhere it meets with much disdain as the "copy theory" of knowledge. For since the judgment says that the character of its content belongs to the object, and the content is made up of a certain connection of elements which exist also in the form of psychological content, it seems to follow that there must be a correspondence between the ideas as mental facts, and the reality; and this, we are told in various forms, is absurd. I wish to examine the reasons for this rejection of what after all looks so simple to the naïve mind.

The first reason is easily stated, which is more than can be said of the others; and it is frequently regarded as in itself final. How, it is asked, if truth consists in an agreement between our ideas and reality, can there be, for human beings at any rate, any such thing as truths in particular, since to attain truth seems to involve a condition which can never be met? By definition, the ideas are in the mind, and are the only things we ever directly experience; the things are outside consciousness, and as such inaccessible. Now we can compare two things of both of which we have some experience; but how can we compare a thing which we meet in experience with one which we never meet? The copy idea, therefore, is absurd, Q. E. D.

Now with regard to this I have at present only two or three things to remark briefly. To begin with, the foundation of the charge is of course to be admitted. We do not, in some instances at any rate, and these the most important, come into direct contact with the reality which we know, and there is always, therefore, at least the academic chance of our being mistaken. If one refuses to be satisfied until this chance is eliminated, he can not, of course, accept the theory, though it always remains possible that he is rebelling not against an erroneous theory, but against the conditions of human life on this earth. But more than this it does not seem

sary to concede. It surely is possible, pending a more careful investigation that should dispel this chance, that we still might have *grounds* for believing something about things we never have experienced; which never, that is, have come as existences within the experience process. It is true that in the definition of truth there is nothing to enable us to distinguish between grounded and groundless belief; but it does not follow that there is nothing in the nature of experience either. A definition of truth does not profess to be a criterion of truth, and can not be blamed because it does not do the office of a criterion. We could hardly ask, indeed, what distinguishes truths from falsehoods, without first knowing what we *mean* by truth. All that I say is, that there is a common assumption lying at the base of any and every claim that something is true—the assumption that it is true *of reality*; what reasons we have for thinking that in some cases it actually *is* true of reality, while in other cases the correspondence does not really hold, is a further question. This I am not proposing to answer; but not to leave the matter wholly in the air, it may be noted, first, that the belief that our ideas correspond to reality is not to be regarded as a result of comparison, but as an assumption or postulate; and it may be asked why, even if it can never be directly tested, it may not conceivably be tested indirectly by the *consequences* which we *do* experience, and which are supposed to stand in some rational connection with this assumption of an experienced reality. For the present, however, I am content to appeal merely to facts; and it is not without importance that beliefs of this kind undoubtedly exist, strong beliefs, which involve the assumption of a correspondence. The one which I should select as least ambiguous is the belief in the existence of an inner life in our fellow men. I see my neighbor throwing up his cap and shouting, and I say, He is very much pleased over something. I mean by this, as I think every unphilosophical person will allow, that at the moment I perceive his shouting, there is a certain psychological fact in existence, an emotional feeling within the current of experience which I call his conscious life, which I can interpret because I have had similar feelings in the past, but which I do not now actually experience, but only believe in. Yet I declare that I have a *knowledge* of this feeling; and I am able to describe this except by saying that I have in my mind an idea of joy which I refer to his actual inner state, though this is beyond me and the connected stream of consciousness to which my ideas belong; and the very act of referring this assumes that it is in some way adequately adequate to the reality. This is a situation surely offering enough difficulty to the denier of transcendence and dualism to deserve very close and candid attention; but so far as my reading goes, he is much more likely to mention it casually, and then to pass

by on the other side. Professor Perry, in his "Present Philosophical Tendencies," is an honorable exception; but while he really considers the difficulty, I do not see that he helps greatly to its removal. There may be depths to his argument which I have failed to plumb; but I really can not see in it anything more than a rather pretty case of begging the question. Apparently it refutes the "privacy" of individual minds by appeal to the fact that we can "know" another's mental content. This of course dualism does not deny; but instead of arguing that because I can know, say, another man's emotion, that emotion must be bodily present to my knowing consciousness, it rather argues that because, obviously, the emotion is not thus bodily present, knowledge must be different from what the denier of transcendence asserts it to be. An emotional content furnishes a better instance here than an ideational, because it does not so readily lend itself to a certain ambiguity. I can say, plausibly, that my idea, and my neighbor's idea which it knows, are the "same" idea, because usually in such a statement I am concerned with content, and not with psychological existence; but it is not so plausible to affirm that my idea of his emotion, and the emotion itself, are the same. And it is of course on the side of existence that the imperviousness of minds is intended to be understood.

There is a second form of objection which will make it necessary, however, to examine the situation more closely. This attempts to turn the flank of dualism by asserting that it is not in reality two things, an idea *and* a reality, that common sense itself believes in, but only one; and therefore that the copy theory is a speculative misreading of the facts. This claim it usually attaches to the judgment of sense-perception, where it undoubtedly can be made most plausible. The dualistic position maintains that when I judge, Here is an object present to sense, what I mean is this: A real thing is making an impression on my nervous system, accompanying which there is a sensation or group of sensations in my mind. These last are what alone I actually *experience*; but they reveal to me the presence of an object which lies beyond experience (though not, of course, beyond *knowledge*). Now this, the criticism goes, is not the true interpretation. When I see an object I am not conscious of two things, but only of one. What I see is the object itself, not my sensation of the object. The object is right there in experience, not veiled from us by a copy of itself. In the sense experience there is no hint of a copy at all.

As a description of the naïve experience, this is undoubtedly in a sense correct. I do seem to see, and know, the real object directly. But this does not settle the business of dualism. Dualism may at

mes have used words inadvertently which lay it open to criticism; but a clearer statement of its real meaning will, I think, extricate it from any serious embarrassment here. If, for example, it talks about knowing only our own sensations, and inferring to something beyond these, it does not really hold that in actual perception we are conscious of performing this twofold process. The mind does not perceive its sensations, it perceives or knows the object; but only through the sensations which the object sets up. This is a highly relevant distinction, and the offense to common sense can be avoided by sticking to it. Indeed, the objection ignores the very point of the dualistic definition of knowledge, which is the reference of the real content to an object, not to our psychological states. Take first an instance which eliminates the peculiar perplexities of the sense experience. What happens, for example, when I think about some other man's motives for a course of action? Am I thinking about my thoughts about his motives? Certainly not; I am thinking about the motives themselves, as objective facts. But can I think about these motives of his without at the same time having thoughts of my own? As certainly not. While I am engaged with the objective reference, however, I do not think about my own thinking. My attention is not turned to it; I do not know it, then; when I do become aware of it, if at all, it is as the object of a new act of attention and knowledge. This is the simple explanation of the whole difficulty. Where common sense maintains, quite correctly, that we are in knowing conscious of no discrepancy between idea and object, is in connection with the original act. Just as in thinking about anything I am thinking about that thing itself, and not about my thought of it, so in perceiving an object I am perceiving the real object, and not my perception of it. Common-sense dualism is an outcome not of the original act, but of a reflection upon that act; and if it never reflected, it doubtless would fail to discover the true state of the case. The insistence of the critic that we should stick to the original experience is simply the insistence that we shall erect a philosophy on the assumption that we are not to philosophize. Common sense could be inarticulate if it consisted merely of first experiences; of course it has introduced already much complication and theory into its beliefs. The way to treat this is not, however, to try to strip away the theoretical elements, but to test them, and see whether they are sound. And when reflection comes, I feel certain that it is equally the judgment of common sense that there are two things involved. With a little psychological practise, after thinking about someone's motives, or my own, for that matter, I easily discover that I was *thinking* about them—that certain ideas were in my

mind. Having made this reflection, I also discover that these thoughts are not identical with their object, the motives themselves, just as in reflecting on the perception of an object, I discover that I had certain fleeting sensations which I hesitate to identify with the permanent thing of the perception. And now having got so far, I imagine it equally certain that common sense would hold that while thinking about anything, the only thing actually present at first hand and bodily in consciousness, or experience, is the thought, and not the object of the thought. The other man's motives, as original driving forces in his inner life, never actually were in my experience—I never have *felt* them as he did; my own motives in the same sense are not now, when I know them, actually in my experience; all that is there is the thought itself, as a reference of a certain content to an outside and unexperienced, but of course *known*, fact. So the perception is the reference of a sensational content to an unexperienced, but known, real object. Any satisfying theory must, it would seem, find a place for these very strong persuasions; and the dualistic theory of knowledge does, to the best of my belief, succeed in doing just this. It accounts both for the persuasion that there are really two things, and for the immediate recognition of only one. This last is due, again, to the fact that attention can not be directed to two places in one and the same act. Knowledge involves both a psychological existence as the bearer of its reference, and the reference itself. It is this last that sets the direction of attention, which can only double on itself by a fresh act.

But, the critic may continue, here is a mystery. An idea, a particular psychological existent, has the very peculiar property of being able to jump out of its own skin, bridge an impassible chasm, and somehow connect us with an unexperienced object on the other side; is not this calling for a good deal of philosophical credulity? Now I admit the desirability of getting rid of mysteries as far as seems feasible. But when the mystery is something that is involved in the very nature of thinking, it seems to me to call rather for a more resolute attempt to resolve it than for its repudiation; and even if it can not satisfactorily be cleared up so as to leave no opaque residuum, I see no self-evidence for the assumption that nothing goes in this universe unless it is sun-clear to the philosopher. Now the assumption in question is one which it does seem to me totally impossible for the philosopher to escape making at some point along the line, except by the refusal to reflect; where this would leave his standing as a philosopher I do not stop to ask. Suppose he takes the position that in knowledge there is no transcendence whatever, no leap into the unexperienced. There are various ways in which the difficulty then might be put up to him; perhaps the simplest is in terms of memory.

you have discovered this important fact, he might be asked, what evidence in the form of past experiences, on which supposedly you have brooded and reflected? But in so far as your pronouncement is understood to base itself on the evidence, isn't there some evidence which you are bound constantly to refer to, but which as an evidence is irretrievably gone, and so incapable of entering bodily into your present experience which thinks it, or into any future experience for you?

However, though in case of failure I reserve the right to continue to accept the fact simply as a mystery, I do think that the demand that it should attempt to give some account of itself is a fair demand; and there is something which it seems to me can really be said. Professor James has, I believe, pointed out what is essentially the truth of the matter, although he does not appear to me to have appreciated accurately its consequences, and therefore has used every effort to disprove the very possibility on which I am inclined to rest. The problem, as James puts it, is this: What do we mean by saying that an idea means an object, do we mean by *meaning*? His answer is, roughly, as follows: I think of, or mean, a certain familiar building; what is the descriptive character of the act? It is the passing through a series of connected experiences which culminate in the actual perception of the building itself. The act can be interpreted in terms of a string, or series, of transitional experiences through which anticipation is led to experienced perception. This often, Professor James admits, stops short of actual realization. Sometimes we are content with the feeling that we should carry the process to its end; sometimes also, with our best efforts, we are carried only into the *vicinity* of the object. But the essence of knowing is this, that it will get us to our goal.

Now I believe that this really contains the gist of the matter. It is this which makes it most unsatisfactory to leave the mystery unexplained; it is, I think, not the question how a gulf can be bridged, but what we mean by bridging it, and getting to the other side. In other words, it is this relation of the idea to something out of experience a *quasi genereis*, which we simply have to accept in its opaqueness? It is this which makes it a prototype within experience itself in the stricter sense? The merit of Professor James's theory is, it seems to me, that it has brought out, in terms of a certain sort of psychological experience, the nature of every case of transcendence, so that if there still remains any mystery, it is not a mystery connected specially with the knowledge of an independent reality. The nature of "meaning" is to be found in that concrete experience of satisfied expectation, where anticipation, or anticipation, finds itself met by the experience which it anticipates. So far I find James's theory adequate.

But now if this is so, what of the claim that transcendence has been eliminated? As I have just implied, the fact seems to me to be that the mystery has simply been brought within what is commonly called the psychological realm, not evaded entirely. For what of this series to which meaning has been reduced? Is it the actual transitive series as a whole, from the first start of initial idea to final percept? Professor James inclines to talk as if this were what he had in mind; but it seems clear that such an interpretation will not do. A mere string of transitive experiences is not the anticipation of a future experience; and it is only as something has been anticipated, while not yet present bodily, that the peculiar feeling of completion can result. But the essence of anticipation is not the actual series, brought to an end in perception, but the series, usually very much syncopated, existing in *imagination* before the end is actually there. James's theory, in other words, ought to change the definition of meaning from the realization of the end term, to its realization in *imagination*. Otherwise James falls into a dilemma. If knowledge is actual attainment, then there is no knowledge, or meaning, until the final percept of the building is reached; but when this is reached, then, as James himself maintains, we no longer have "knowledge about" the thing we set out to explain, but "acquaintance with," an experience of perfect unity. It seems evident, therefore, that meaning must be the anticipation of fulfilment in imagination, and that consequently there must exist, to form the knowing experience, a synthesis of content in an experienced unity, which includes alike the idea, the sense of present unfulfilment, and the reference to some future experience which, if attained, would be found to correspond to and complete the idea. But this is to admit precisely the thing which in principle is in dispute. In saying that a future experience, not yet existent, is anticipated, there is just that transcendence of the present idea that does the knowing which has been denied. This is evident in any case; but it is peculiarly evident when James admits that sometimes the anticipated realization is impossible, at any rate for the present, and that all that we are led to is the *vicinity* of the object. How on such a showing, if we really are thinking of the object itself and not of its suburbs, James is able to get around the notion of a gulf, and of a grasping in idea somehow of what lies beyond the gulf, I find myself totally at a loss to comprehend.

For my own part, I have of course no difficulty here. I can, therefore, follow the positive part of James's theory, as providing a typical experience which gives content to the notion of an idea *meaning* a reality. It is the feeling of fulfilled expectation, which I have often got when both the anticipation, and the thing antici-

d, have been experiences of my own. By knowing a thing, I find that I mean on analysis a vague sense of the possibility of this sort of experience being repeated. But now, having the type, I go further. It is not the actual fulfilment, again, which constitutes the knowing experience, but rather the *idea* of fulfilment; having the idea, I can extend its application. As James himself grants, I can extend it to the case where the fulfilment is postponed. Here my *meaning* is the same; it is only that the final test has not been made, and so there is still a chance of error. It is quite possible, even, that the postponement may be extended till the opportunity is lost; I may die before fulfilment, as I doubtless shall before seeing many interesting things in the world which yet are in the ordinary sense a part of my stock of knowledge. But for James this represents the limiting case; unless there is the possibility, some time and somehow, of the object of the idea coming itself into a unity of experience with the knowing thought, and being felt to be the very object we mean, he will not allow that knowledge has any meaning for us. But I fail to follow this. All that is necessary, in order to describe a truly transcendent object, is that in thinking about such an object, or having it in mind, believing that a certain character belongs to it, or *meaning* it, I have the recognition, not simply that I can not now verify it, or that I can not verify it in my lifetime, but that it is forever out of the reach of direct verification in the sense in which I can verify the truth of future experience to myself, because it is incapable of becoming a member in the same continuous experience series with the thought which knows it. When I think, or mean it, the sense attaching to the phrase is, that *if* I could ever arrive at the identical fulfilment itself, I should have the same feeling of expectation realized as I have in cases where the verification is humanly possible—here the notion gets its content,—but that at the same time I recognize that the fulfilment is, not temporarily, but forever and necessarily, out of reach. I see no difficulty in this; and if, accordingly, the facts seem to require it, the notion of a reality capable of being recognized as beyond experience presents no greater mystery than the knowledge of other parts, not immediately present, of our own experience. To be sure, we still should have to ask what ground we have for asserting such realities; but that, as I say, is a further question.

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THE PSYCHOPHYSICAL CONTINUUM

IN a recent discussion of the relational view of consciousness¹ Mr. Marshall takes occasion to reaffirm the familiar distinction between the "natural order" and the "mental order." In the natural order he places the "stream of appreciations of the existence of what we in thoughtful reflection come to call objects in the outer world; the chair, the table, the fireplace, etc." But in addition to this stream "there are discovered items which are felt to be of a different order. . . . The three items, warmth, desire, belief, may be taken as typical of innumerable instances of these appreciations of existences which . . . are usually grouped together as items within what we may call the mental order, or what is usually spoken of as consciousness." Mr. Marshall seems to feel that there is a real gulf fixed between these two orders, and that the existence of this gulf constitutes also a barrier between the study of behavior and the study of consciousness.

It occurs to me that the whole matter may be much simplified by recognizing the purely statistical character of the distinction and by noting that there is as a matter of fact not a gulf, but a gradual transition and continuity between the two so-called orders. It is true that in daily conversation and also in common psychological classification we emphasize the natural as opposed to the mental, the cognitive as over against the affective and conative. But so also do we distinguish between black and white, long and short, and between various other ends of continuous series. It seems to me that psychological classification, and hence both psychological and epistemological theory, have suffered from the uncritical acceptance of purely practical distinctions, based on the statistical features of the experiences indicated, and that epistemology will be relieved and psychology clarified by having the points noted, even if in a rather naïve and amateurish way, unembellished by metaphysical vocabulary.

To begin with, the objects constituting the natural order are put there merely because of the universality of their occurrence. When one of us experiences table, fireplace, etc., and our fellows are interrogated, a universal affirmative verdict is assured,—all or nearly all of them report the same experience. Or on different occasions I myself continue to report it. At least the conditions required for such a verdict are rather easily satisfied,—it requires merely that the light be turned on, that a curtain be withdrawn, etc. But when I report the presence of desire, belief, emotion, etc., and interrogate

¹ This JOURNAL, Vol. X., page 477.

my fellows, the affirmative reports are likely to be fewer,—I may be alone in my testimony, I may receive the confirmation of a few intimate associates, or indeed a fairly large group may agree with my report—"Anger is now experienced." But the verdict is far from universal, and it is furthermore difficult to arrange the conditions for such a verdict, if not indeed impossible. It may require a long course of neuro- or psycho-therapy.

Sometimes, indeed, when a closed circle of associates is concerned, an emotion, a desire, etc., may be universally reported. On such occasions the reported experience takes its place in the natural order and is designated by an object-name, as *The Holy Ghost*, *The Spirit of the Lord*, etc. This is particularly true when the experience is not one of the routine sort, but depends on some rather rare condition or set of conditions. The fever, the plague, beauty, are other instances. Such experiences are given full objectivity in our table talk, in economics, sociology, and history. The plague "is spreading," "is being combated," etc. The fever "is identified," "is restricted to a certain area," etc. Disease entities, complexes of "pathological" experiences, very nicely illustrate the transition region between the natural and the mental orders. The reason for this is obvious—it is usually fairly easy to effect the conditions requisite for a universal or widespread report of symptoms. Medical prophylactics is mainly engaged in maintaining a set of conditions which will justify us in classifying the various diseases as objects of the mental order. Religious zeal of a certain kind, on the other hand, is chiefly engaged in perpetuating or reviving conditions which will induce us to classify various "emotions" as objective existences in the natural order.

Esthetic experiences again easily come to have objective character, because such large groups of observers report identical objects. Thus beauty, ugliness, sublimity, harmony, are not classified as peculiar modifications of the self, as are anger, fear, and perplexity,—they are properties of objects, they are assigned existence well down toward the "natural" end of the continuum of experience. Only an international experience suffices to convince one that the beauty of a given art form is not as intrinsic and fundamental as is the resistance of a solid object, or the brilliance of a pencil of homogeneous ether waves.

Analytic psychology, again, in its attempt to pigeonhole those experiences which are mainly toward the "mental" end of the series, gives us such rubrics as feeling, belief, judgment, perception, and in the past has assumed the existence of certain qualitative differentia between the experiences thus named. But it should be noted

that every "introspective" attempt to formulate the ear-marks of the variously named experiences has resulted in failure, and in the conclusion that all these experiences merge into each other, that, in fact, in Mr. Marshall's words, consciousness is "a complex of diverse emphases within a whole psychic pulse" and that "in so far as these emphases display observable characteristics, the average man gives them special names, *e. g.*, 'thoughts,' 'desires,' 'believings,' 'emotions,' 'sensations,' etc."

As a matter of fact the observable characteristics, so far as used in psychological classification, are chiefly statistical. Thus I am said to "perceive" an object, a difference, a relation, etc., when the greater part of the total distribution of observers or observations make a similar report. I am said to make a "judgment" of difference when the verdicts, either of other observers or of my own repeated reports, are frequently contradictory. Sometimes, to be sure, another factor is considered, viz., the degree of confidence of the report, that is, the briskness of formulation, the speed with which the object or situation develops, and the clearness or intensity which it finally displays. Thus when a visual object develops quickly and in an orderly way and when motor adjustments, in the form of handling, naming, etc., develop in a definite and standardized form, I say I *perceive* an object, but this is chiefly on the basis of the fact that in the long run I have found that this sort of an object or situation is one which will be universally reported. But if the object develops slowly or irregularly or if the handling or naming reactions are uncertain or uncoordinated or novel, I am likely to say "I *feel* it" to be such and such an object, I *judge*, I *believe* it, etc.

Thus in laboratory experiments on the differential threshold, various degrees of confidence are likely to be reported in some such way as the following:

(A) If the difference is exceedingly small, so small that its direction is not evident, though its existence is suggested, the observer is likely to report that he *feels* a difference.

(B) If the difference is increased somewhat, not only will the existence of a difference be reported, but its direction will also be asserted, though the observer reports the direction not to be absolutely constant, but to vary from moment to moment. He will then be said to be *judging* the difference.

(C) Increase the difference still more and the observer will report a difference which continues to have the same direction through successive trials or inspections. He then holds a *belief* with respect to the difference, a belief, be it noted, which may not accord with

objective conditions² because of the presence of certain constant errors or motives to illusion.

(D) A larger difference still will be said to be *perceived*, since it is not only clear, but its direction is consistently reported and coincides with the consensus of other estimates or verdicts or with those estimates which are so universal that they have been standardized as objective.

Now if requested, the observer can easily indicate the various degrees of report by the four degrees of confidence, *D*, *C*, *B*, and *A*, and more degrees than this he will hardly find possible. Furthermore, his various percentages of correctness will be found to be about 65, 70, 80, and 95. Or if different observers are used and their reports compared, similar differences will be found in the variability of their reports. In other words, here we have, in the case of the same general situation, four distinguishable types of report, which we name, respectively, feeling, judgment, belief, and perception. They are distinguished from each other only by the universality of their verdicts. In the same way, we never say that an observer judges the sun to be rising, or feels or believes it to be rising, unless he is reporting under circumstances which would produce varying reports from different observers or from the same observer in different trials. So also, one *perceives* that water extinguishes fire, *believes* that honesty is the best policy, *judges* that the defendant is guilty, and *feels* that a given blue is more agreeable than a given green.

It is not uninteresting to note that there is a larger gap, from the point of view of percentage of correctness, between the *A* and the *B* judgments than between the other degrees of confidence. This reflects the sharp distinction which we have made in practical life between the natural and the mental order, between perception and belief.

It should be noted that there are here only two factors which have qualities; one is the object, the other is the organism. There is no need for *sensation* or for *consciousness* which is other than, aside of, or in addition to, the object-organism complex.

It may be asserted that in addition to these purely statistical differences between these various types of experience, there are other differences of a purely qualitative sort. Thus it is often said that the feelings have a peculiar warmth, intimacy, and personal character, which perceptions do not have; that they are felt as modifica-

² By objective conditions we mean, of course, only the reports of observers who have fuller means of examination and comparison, the consensus of all other estimates. By "the stimulus" is meant only the object as known in some other way, by some other person, or on some other occasion.

tions of the self rather than as qualities of objects, etc. It should be observed in the first place that such statements, if they are intended as universal propositions, are false. The Holy Ghost is felt to be, not a personal modification of the self, but a real entity abroad in the land, in the same land where stalks the Panic, the White Plague, the Measles, the Cold Weather, and where are found the melody, the difference tones, the stars, and the apple blossoms.

In the second place, this personal and private characterization of the affective, relational, and conative experiences is but an obscure way of pointing out their statistical limitations, their relative lack of clearness and persistence, and the unfamiliar and unanticipated nature of the adjustments to them. Experiences, to be sure, display many points of difference, afford various categories of predication, but along with the differences I have pointed out they are thoroughly "natural" differences and should all be treated in the same objective way. A desire differs in many details from a joy, and in still further ways from a color. But so does my fountain pen differ in many ways from a whiff of smoke, an itch, an oyster, a glass of lemonade. The Holy Ghost Experience, for example, is more like an odor, or a melody, or an itch, than it is like jealousy or hatred.

Diverse as are the ways in which experiences differ, various as are the relations which experience affords, they are all equally natural and equally mental. They are all, in other words, psychophysical; psychical in so far as they are indefinite and rare, physical in so far as they are definite and common. And it is highly probable that their definiteness is largely a function of the frequency with which they are met.

The physical world, with which the physical sciences deal, and for which are developed the various shorthand symbols by which we designate the objects as independent of experience, consists of those experiences which are statistically common. The independence of these objects, their stubbornness, their resistance, their objectivity and naturalness, these all are not unique characteristics which suffice to split experience in two, they are merely various and interesting ways of stating the same statistical fact. The dependence, the subjectivity, the personal character of other experiences, the so-called mental order, are merely literary terms which express their statistical limitations and their consequent vagueness and complex conditions of appearance. The intermediate zone, comprising those experiences with only average statistical possibilities—the diseases, the communistic sentiments, the fervent local emotions, the qualities afforded by the proprioceptors, such experiences as panic, ague,

beauty, warmth, etc.—have been strangely neglected by our classifiers.

It may seem strange that in the case of the objects at the one end of the curve of distribution we have failed to develop conceptual names, such as are used in the physical sciences to connote the occurrence or possibility of general statistical experience. But there should be no difficulty in seeing why this is true. The same tendency is to be seen even among those experiences which we have come to call natural objects. When only one or two catastrophes of a given kind occur in history or in life we need no general concept such as electricity, etc., by which to refer to them. Each receives its Christian name, such as the Burning Bush, the Star of Bethlehem, the Aurora Borealis. But when such experiences assume larger statistical proportions, and resemblances are detected, physical sciences develop generic symbols for their reference, and these symbols become, in proportion to their statistical necessities, the eternal verities of reality as distinguished from appearance. In the same way the early apostles, impressed by the locally common experience of certain religious ecstasy, conceptualized its various occurrences, and the Holy Ghost was born. But for the failure of adequate statistical verification this object would have taken its place along with electricity and the ether as an eternal verity.

When a majority of properly equipped astronomers report the appearance of a new sun-spot, no problem is afforded the psychologist thereby. The phenomenon is felt to belong to the physical sciences. But when only one astronomer reports the celestial novelty, and his fellow observers, under the same general conditions, make no such report, the psychologist is at once interested. The event has taken its place in the mental order, rather than in the natural order.

In this sense, and in this sense alone, psychology may properly be defined as the science of behavior,—it is the science of the behavior of statistically variable experience. The symptoms of a disease, the manifestations of an emotion, and the relational features of various other experiences, these correspond to the properties or qualities of objects. All sciences are studies of behavior. The subject-matter is determined by the statistical facts alone.

There remains, perhaps, in some mind, the old riddle presented by physiological psychology. The neurologist and brain anatomist point out that those experiences which we call sensory depend on the peripheral stimulation of certain of the nerves of an organism; that the cognitive processes depend on the elaboration of these nervous processes by their fusion with synchronous processes from

other nerves and by the habits imposed upon brain centers by virtue of previous activity. He finds special cortical areas involved when we have those experiences which we place in the natural order,—the sensory qualities, the objects, etc. The so-called affective, relational, and conative experiences he says are not found to depend on such specialized centers; they arise in some way from the interrelation of these various mechanisms and their correlated motor paths of egress. They are generated, not by physical stimuli, directly, but they reflect merely the condition of the organism at the time—the amount of energy at its disposal, the facilitating or inhibiting relations of neural tendencies, the metabolism of the tissues, the liveliness of the nervous impulse, general tonus, etc. Hence they have no reference to the natural order, these inner mental experiences; they are subjective and thoroughly illusory if taken to be items in a real world. Pleasures, beliefs, emotions, relations, are tertiary qualities and to be sharply distinguished from the objects of cognition.

Similarly with the secondary qualities, such as color, taste, warmth, etc. He reports no trace of color or taste or heat in the impulses that travel inward from the periphery, whether in the intermedia or in the nerves themselves. These qualities, he tells us, are secondary and reveal not the properties of the natural world, but the way in which the objects of that world affect certain sorts of protoplasm in the cortex. The primary qualities of resistance and extension, and perhaps of change and duration, are the sole experiences which reveal reality. The real world he says is not beautiful, nor is it angry, nor is it even colored or fragrant. These are purely mental qualities which psychology may study since the other sciences are busy with more important matters.

To such a person, be he neurologist, metaphysician, or what not, there is only this to say. The reason he can not see the color in my optic nerve is that he is looking at it flatwise. If he could only look through it endwise as I do he would see objects that are just as colored as they are ponderable when observed through the nerves of his tendons and muscles and joints. Of course he can not see the colored object if he persists in looking at my gray matter. If he would look at the object the chances are 1,000 to 1 that he would report a color experience. The chances are 10 to 1 that he would also report a beauty experience. The difference in the chances is what justifies me in calling the one more mental than the other. If he will reach out his hand, the chances are 1,000,000 to 1 that he will report an experience of resistance. That is why I call resistance a physical fact. The chances are about even that he would

ke to use the object for some purpose or other, and this low probability is what I mean by saying that desire is a very subjective and highly mental experience.

The air waves which strike my tympanum our physiologist carefully scrutinizes. He reports that he *sees* no noise there, nor even in the temporal lobe of my brain, which, when removed, condemns me to a noiseless experience. Certainly not, for noise can not be seen. If he will put his ear where mine is the chances are 1,000 to 1 that he will report a noisy experience, 10 to 1 that he would call it disagreeable, 2 to 1 that he would try to avoid it.

It is of course easy to be wrong in a case of this kind. It will generally be assumed, no doubt, that judgments are not distinguished from perceptions *because* of their statistical differentia, but rather that the relative frequencies of the two types of experience *follow* from certain more essentially qualitative differences. This is just the proposition I am denying. What I mean to say is just that the statistical differences are the sole criteria of classification. As soon as an experience hitherto called a judgment becomes a common judgment it is at once called a perception, and this with no change whatever in its qualitative characteristics.

The fact that objects display certain relations and interrelations which do not characterize such experiences as emotion or desire is on a level with the fact that some objects are organic, others not, some objects positively charged, others not. Many experiences of the natural order, such as odors, sounds, do not possess the property of extension and do not easily fall under relations of distance and direction, yet these experiences are not classed as modifications of the self,—they are almost as completely objectified as the visual and actual experiences. That they are not quite so fully objectified is due solely to their greater statistical variability.

Cortical changes, the dance of molecules in the brain, may be requisite for all kinds of experience. Some of these changes are visible, some audible or tangible or enjoyable or desirable or comestible, etc., to the organism in which the changes take place. But what does it signify if the neurologist discovers that visible experiences of color, for me, are accompanied by visible experiences of dancing cortical molecules in my occipital lobe, for him? Or that when I am getting auditory experiences he may be getting tactual experiences from the string he has glued to my tympanum. All that this means is that when one organism has certain experiences, another organism, in rather different circumstances, always gets certain other experiences. Such correlations of experience are common. My failure involves your self complacency, my joy is cor-

related with your jealousy, etc. Experience is full of correlations and it is the business of the various sciences to discover them and to record them. Once this is completely done, there is nothing else to do but sit down and take experiences as they come. But the correlation of what we call a mental fact with what we call a physical fact is no more mysterious than, and is the same in kind as, any correlation between two physical or between two mental facts.

Each experience will be found to require varied attendant experiences, or what we call conditions. Some of these conditions will be found common to all organisms, and the correlated experiences, with high statistical frequency, will form the "natural" order, and will be studied by the physical sciences. Other experiences will be found to depend on sets of conditions, attendant experiential complexes, which occur much less often, less easily, but may sometimes be found frequent in certain special groups or localities. These we will call affective, epidemic, social experiences. Sociology, medicine, esthetics, and ethics will study them. Many experiences will be found to depend on fine adjustments and close connections of attendant circumstances. These will occur still less commonly and will constitute the general subject-matter of psychology.

But there will be throughout no gulf between psychical and physical, between the natural and the mental orders. It is as meaningless to ask, "Does consciousness exist?" as it is to ask, "Does nothing exist but consciousness?" It is quite unnecessary to insist on giving up either one end of the experience continuum or the other end. It is equally unnecessary to talk about the two extremes as if they were fundamentally and qualitatively different sorts of being, displaying a mysterious and inexplicable dualism or parallelism or interaction or identity or what not. All experiences take their place in the surface of frequency and the differences between them are not a matter for mystical rumination, but for such attempts at correlation as those in which the empirical sciences are engaged.

H. L. HOLLINGWORTH.

COLUMBIA UNIVERSITY.

REVIEWS AND ABSTRACTS OF LITERATURE

The Psychological Researches of James McKeen Cattell. A Review by Some of his Pupils. New York: The Science Press. 1914. Pp. 101.

The purpose of this little volume is indicated in its foreword: "The pupils of Profesor James McKeen Cattell, wishing to recognize in some public way his completion of twenty-five years of service as professor of

psychology, have decided to attempt a review, in brief compass, of his work in psychology, with some notice also of recent developments in several fields in which he has been a pioneer . . . it is hoped that this volume will bear witness, in a modest way, to the high esteem and sincere affection in which Professor Cattell is held by the many whom he has trained and guided in the study of psychology."

The work contains six reviews, each of a different phase of Professor Cattell's work, as follows:

Professor Cattell's Work on Reaction Time, by V. A. C. Henmon;
Professor Cattell's Studies in Reading and Perception, by Walter F. Dearborn; Professor Cattell's Relation to the Association Method, by F. C. L. Wells; Professor Cattell's Psychophysical Contributions, by R. S. Woodworth; Professor Cattell's Studies by the Method of Relative Position, by H. L. Hollingworth; Professor Cattell's Relation to the Study of Individual Differences, by E. L. Thorndike.

Each reviewer points out fully the value possessed by Cattell's researches, by virtue both of the results reached by Cattell himself and of the further studies by which his work has been followed and, presumably, extended. A good deal of attention is given also to historical setting. This is especially true of the review by Henmon, which traces the history of work in reaction time from the earliest times to the present, and constitutes one third of the volume.

Henmon concludes his review with the statement, which can not be overemphasized, that "the two most prominent contributors to the literature of reaction time have been Professors Wundt and Cattell." As regards the specific problems which Cattell investigated, Henmon gives the following enumeration: "His experiments furnished new and valuable data on the function of sense organs, rapidity of conduction to and from cerebral centers, the influence of the quality and intensity of stimuli, mode of reaction, significance of the time interval between the signal and the stimulus, effect of varying degrees of concentration in the fore period, the effects of practice and fatigue, and an analysis of the times of cognition, discrimination, choice, association, and judgment. This enumeration makes it evident that Cattell's research ranges over practically the whole of this field of experimental work and that no other investigation of the time-determinations of mental phenomena is comparable with it."

In all this work, Cattell's major interest was not in the detailed introspective analysis of the processes involved, but rather in the psychological determination of the time taken up by the mental operations in which one is constantly engaged.

In the review by Dearborn of Cattell's researches on perception and judgment, we meet with a description of Cattell's tachistoscopic experiments. These bore upon the number of objects which can be simultaneously comprehended. They showed that "on an average, consciousness can at one glance grasp four numbers, three to four letters, two words, or a sentence composed of four words." Another problem, of which Cattell was a pioneer investigator, was that of the relative legibility of the letters of the alphabet and of printing types. Cattell also published measurements of

the time required to read aloud letters and words, and to name colors and pictures, and, further, determined the time that light reflected from a word or letter must act upon the retina in order to be distinguished. This time was found to be slightly shorter for words than for letters, an observation which had important bearings for the pedagogy of reading.

Cattell's studies in association consist of two papers published in *Mind*, one in 1887 and the other in 1899. The first deals mainly with the time taken up by controlled and partially controlled associations. The second deals with the subject of free association. The most striking fact about this work, perhaps, is that it gives the frequency of the commonest responses for each of 20 words, as found in the responses of nearly 500 subjects, and the frequency for two words of all the responses obtained. Thus, in a rudimentary way, it anticipates the Kent-Rosanoff frequency table, the highest development the association experiment has yet attained.

In the field of psychophysics, Cattell's main contribution was a work with Fullerton, "On the Perception of Small Differences." His results led him to propose the substitution of a square root law in place of Weber's law. This proposal has never met with much favor, but Woodworth thinks the square root law may hold in certain cases. In the only original contribution contained in the volume under review, Woodworth proposes a very interesting theory according to which both Weber's law and the square root law may be regarded as limiting cases.

In the review of Cattell's studies by the method of relative position (order of merit method) Hollingworth describes fully the method as it was first applied by Cattell in 1902 in his study of "The Time of Perception as a Measure of Differences in Intensity." This is followed by extracts from Cattell's well-known recent works on American men of science, and a brief account of the more recent applications of the method of relative position.

Thorndike's discussion of Cattell's relation to the study of individual differences makes further interesting comments upon Cattell's work on American men of science. "Some of you," he writes, "have doubtless often regretted that Professor Cattell has devoted himself within recent years so exclusively to the topic of individual differences to the relative neglect of investigations concerning the time of mental operations, the psychophysics law, fatigue, memory and association, in which fields he has shown such mastery. I can not join in this regret. From the point of view of public welfare, a community's scientific experts are its most valuable property. . . . If it is worth while to find out what training a future plumber needs to make a competent plumber and voter it is ten-thousand fold worth while to find out what training and facilities the future leader in science needs to make him do his best as an investigator and expert adviser of governments."

The general features of Cattell's work are perhaps best emphasized by Woodworth, who refers to his "catholic temper towards all varieties of psychological interest and at the same time his personal predilection for the more positive sides of the subject, for the study of behavior or conduct, for the use of objective and especially quantitative methods." Along with

predilection for quantitative methods, has gone a keenly critical attitude towards quantitative results.

"All pupils of Professor Cattell will bear witness of his attention to the matter of the probable error. How often have we presented our experimental results in seminar and drawn conclusions which seemed to us to be indicated, only to have our attention called to the probable error of our averages, and to be sent back to our experiments to gather more data or more accurate data. The experience was often disheartening at the time, but the outcome has been a high standard of reliability in the work issued from the laboratory. If there has been in recent years a general improvement in this respect throughout the field of psychological investigation, I can not doubt that it is traceable, in part, to the influence of Professor Cattell, exerted through his writings and through his pupils, some of whom have taken an active part in the progress of quantitative psychology."

HERBERT WOODROW.

UNIVERSITY OF MINNESOTA.

Philosophy: What Is It? F. B. JEVONS. Cambridge: University Press. New York: G. P. Putnam's Sons. 1914. Pp. ii + 167.

This book is the result of a demand on the part of a group of laymen for some insight into the meaning of philosophy. It comprises five lectures delivered before a branch of the Workers' Educational Association. The avoidance of technical terms, the general simplicity of expression, the frequent summaries and the smoothness of the transitions in the argument are all that could be desired in a work of this nature. Although it is maintained that the main purport of the lectures is to present the question with which philosophy is concerned, we find as we proceed that the clarification of the question involves an answer which amounts to a point of view. But perhaps such a step is unavoidable unless one stops with the formulation of the question.

Philosophy, it is maintained, is the attempt to answer the question: What is the meaning of life, of experience as a whole? It is then asserted that this query involves the assumption that life has a meaning, is a whole. Now since we shall discover that the final conclusion concerning the answer to the query of philosophy has its grounds in the conviction that is advanced, it appears that this procedure involves a begging of the question. Would not the problem be more satisfactorily posed in the form: Is life, my life, your life, a meaning; is it a whole? Or in what sense, if any, is experience to be conceived as a whole?

But let us return to the argument. After a chapter on the relation of science and philosophy, the theories of materialism and idealism are examined with regard to their adequacy to supply a satisfactory answer to this question concerning the meaning of life. Both materialism and idealism are rejected, since they prove to be merely abstractions. They explain only certain aspects or elements of experience, not the whole, not life in the concrete. Further, materialism involves determinism; idealism leads to scepticism. Since we have experience of choosing between alternatives,

determinism must be invalid. What, then, is the error of materialism which permits it to involve this violation of the facts? It is held that since materialism is an abstraction its implication of determinism may be discarded without further consideration. It is interesting to pause a moment at this point and examine the logic of this position, since it is a type of argument not infrequent in present-day discussions. Just what is the train of reasoning which allows materialism to be a valid conception while it seems to involve determinism, and since materialism is also an abstraction determinism may not be logically tenable? Granted that matter is only one aspect or domain of experience, if indeterminism violates the implications of that domain, then here is a problem to be solved or the definition of the logical situation must be altered. If materialism thus conceived is a valid theory, then despite its character of an abstraction it can not involve a contradiction. To return to the discussion of the book, it is concluded that materialism and idealism are comparable to two sides of a curve; each involves the other. Also time, space, and matter are abstractions.

But our experience is an experience of activity, it is a process; therefore, it can not be a whole. Now the original inquiry as to the meaning of life involved the assumption that life is a whole. How is a reconciliation of these two positions to be effected? There is necessitated the additional supposition of a perfect Personality. And now it turns out that that assumption requires a previous supposition, the supposition of the existence of a perfect Personality, and the belief that "in Him we live and move and have our being." This final conclusion in the opinion of the reviewer is nothing more nor less than a form of the ontological argument. The idea or ideal of a whole, or of a meaning was the original starting-point; our individual experience does not embody that ideal, therefore the actuality, the perfect whole must be a transcendent experience.

SAVILLA ALICE ELKUS.

SMITH COLLEGE.

JOURNALS AND NEW BOOKS

THE JOURNAL OF ABNORMAL PSYCHOLOGY. October–November, 1915. *A Psychological Analysis of Stuttering* (pp. 225–235): WALTER B. SWIFT. The paper carries the analysis of stutter phenomena deeper than the author's earlier work in which he located the trouble in the nervous system beyond the lower sensory areas of the sensorium and also above the lower motor areas on the motor side. The work may be divided into four sections: (1) Orientation tests on stutterers, (2) Orientation tests on normal individuals, (3) The research, its object and methods, (4) Final detailed results. By orientation is meant a vague try-out to see where the problem lies. The tests for orientation consisted in requiring patients to answer two questions: "Where do you live?" "Say after me, 'The dog ran across the street.'" The presence of stuttering in relation to the presence or absence of the mental imagery was noted. Ten of the twenty

stutterers did not visualize their home, but most of the normal subjects visualized clearly before and during speech. The research was conducted on broader lines with further and more exhaustive investigation in which many questions were answered and introspections noted. The conclusions are: "Psychoanalysis reveals stuttering as some vague trouble in the personality. Psychological analysis shows stuttering is an absent or weak visualization at the time of speech. This concept of stuttering as faulty visualization may be called Visual Center Asthenia. This lack of weakness in visualization accounts for all the numerous phenomena of stuttering in severe, medium, or mild cases. A new treatment is indicated."

The Origin of Supernatural Explanations (pp. 236-240): TOM A. WILLIAMS. "The demand for superstitious explanations depends upon psychophysiological tendencies of the human organism, the root of which is comprised in the affect which we call craving. *Craving*, a sign of physiological need, is a sensory phenomenon of which one may or may not be aware. Reference to the supernatural is favored by traditional cosmogony, and, because of certain psychological features of the individual himself, there is a tendency towards supernatural explanations of the introspective observations." *Data Concerning Delusions of Personality, with Note on the Association of Bright's Disease and Unpleasant Delusions* (pp. 241-262): E. E. SOUTHARD. Delusions of a personal (autopsychic) nature are considered. After examining 1,000 unselected cases in the autopsied series of the Danvers State Hospital, it was found that 306 cases had little or no gross brain disease. Of these 106 had autopsychic delusions and of these 106, 50 cases had delusions of no other sort; 28 of the 50 had been improperly classified. "The residue of 22 divides itself into two groups of normal-looking brain cases having autopsychic delusions and these only are cases which may be termed 'pleasant' and 'unpleasant' groups." The problems of the pleasant delusion group were (1) problem of a group of senile psychoses with grandiose delusions and frontal lobe atrophy, (2) problem of felt passivity under divine influence (3) problem of phthisical euphoria. Most of the cases in the "unpleasant" group are cases with severe renal disease. "Whether the unpleasant emotional tone in these cases of delusion formation is in any sense nephrogenic and whether particular types of renal disease have to do with unpleasant emotion, must remain doubtful." *Sixth Meeting of the American Psychopathological Association. Reviews*: Carl E. Seashore, *Psychology in Daily Life*: L. T. TROLAND. Knight Dunlap, *An Outline of Psychobiology*: G. V. N. DEARBORN. H. Münsterberg, *Psychology, General and Applied*: R. M. ELLIOTT.

Dodge, Raymond, and Benedict, Francis G. *Psychological Effects of Alcohol: An Experimental Investigation of the Effects of Moderate Doses of Ethyl Alcohol on a Related Group of Neuro-Muscular Processes in Man*. Washington, D. C.: Carnegie Institution of Washington. 1915. Pp. 281.

Guyer, Michael F. *Being Well-Born. Childhood and Youth Series*, edited by M. V. O'Shea. Indianapolis: Bobbs-Merrill Company. 1915. Pp. 374. \$1.00.

NOTES AND NEWS

A MEETING of the Aristotelian Society was held on Monday, February 7, 1916, Dr. H. Wildon Carr, president, in the chair. Miss Hilda D. Oakely read a paper entitled, "On the Relation of the Theoretic to the Practical Activity." The satisfaction sought in philosophy is, she said, a theoretic satisfaction, and the question arises whether practise in submitting to be philosophized upon has not already capitulated to theory, and in becoming rationalized been so mutilated as to lose its essential nature. In order to approach the question of the original truth of practical activity, the endeavor must, she urged, be made to estimate the experience as it is prior to the stage of abstraction which generally characterizes philosophies of practise. We abstract in the process of living not less than in the process of knowing; except in rare experiences the will is not fully informed with thought, because both thought and will are weakened. In reality, action and thought are aspects of one and the same process, as thought and extension were conceived by Spinoza to be aspects of one substance. All real experience, whether theoretic or practical, is characterized by the quality of creativeness, and this implies the increase of value, value being that which is primary object of knowledge to the rational and personal consciousness. The ideal value which seems to be revealed to the knowing consciousness as eternal is nevertheless there as aspect of the creating movement of that spiritual reality which works through persons. And, on the other hand, every moment of that increase of energy which is the creation of the practical movement is a revelation to the doer, who may be said to be working with forces, the tendency, direction, and power of which are beyond his comprehension. It is not only that no consciousness in our experience can be only theoretic or only practical, but also that no real work of consciousness can be the one without the other. Consciousness in personal experience does not fully work except in a process which is both theoretic and practical, or in reality something prior in nature to the abstract experience of which these distinctions are characteristic. To the understanding of this reality we are more likely to approach if we take human history as our point of departure than if we take conclusions based on the study of life, or of consciousness, as one amongst the special sciences. History, however, must be taken not in the form to which it is reduced by the scientific intelligence, when for special purposes of knowledge it is subjected to the methods of science, but history prior to this abstraction, as the process of that practical spirit of which we have in our own consciousness a more direct kind of knowledge than in any other subject-matter. For we never experience life which is not history, and when in the grasp of history we realize it is truer to say that life follows because the forces working through history required this field of experience for their expression, than that out of life, when it had reached a certain degree of complexity, history arose or evolved.

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AND

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

THE TECHNIQUE OF COMBINING INCOMPLETE JUDGMENTS OF THE RELATIVE POSITIONS OF N FACTS MADE BY N JUDGES

INVESTIGATIONS in the mental and social sciences often need to use measurements by relative position or rank or "order of merit." In such cases the series of facts to be ranked may not in entirety be known to any one judge. One judge may be able to form an opinion concerning only facts 1, 2, 3, 4, and 5; another judge may be able to rate only facts 1, 2, 6, 7, 8, and 19; a third judge may be able to rate only facts 6, 7, and 9. The investigator has then the problem of assigning the most probable order of merit to facts 1 . . . n , on the basis of a combination of several partial orders; or of assigning a fairly probable order obtainable without undue expense of time.

The technique for handling this problem has not, to the author's knowledge, been seriously considered, though, of course, the principles involved would be obvious to anybody familiar with the general theory of measurement by relative position. Since the problem will be met very often in applied psychology, I present here a fairly satisfactory procedure used in estimating the general intelligence imputed to each of thirty-four college freshman by the combined judgment of eighteen individuals who knew from 14 to 29 of the thirty-four, and rated those whom they knew. We have, that is, as our data, the facts of Table I., the ratings being made in accordance with the following instructions:

"Place a cross at the right of the name in the case of the individuals whom you know, including yourself. Then consider these individuals and mark with a 100 the man who, in your opinion, has the best intellect. Mark with a 1 the man who, in your opinion, has the least intellectual ability. Mark with a 99 the next to the best for intellect, and with a 2 the next to the worst. Continue marking down from the top or up from the bottom until all the individuals that you know are marked. When two individuals seem to be closely alike in intellectual ability, give them each two marks (for example,

if after marking the first two at the top 100 and 99, the next two seem to be closely alike in intellect, mark each of them '98-97'). Grade yourself without over-modesty, as impartially as you can."

For convenience the first step is to get a rough approximation to the true order by inspection, or by computing the median position for each individual, or otherwise. It is obvious, for example, from inspection that individuals 35, 20, 4, 40, and 2 are high-numbered and that individuals 1, 8, and 26 are low-numbered.

In the case in hand the rough approximation left individuals 19 and 33 out of account, since they were graded by only one individual, and could best be treated separately. The resulting order was that of the heading line of Table II.; and in accordance with it the facts of Table I. were rearranged to form Table II.

The next step is to get a nearer approximation by measuring each individual, beginning at the right in comparison with his neighbor to the left in Table II. This is done by finding the percentage of judges (using only those who rated the two individuals in question), who rated the former individual as lower numbered than the latter, and computing the amount of difference represented by this percentage. The latter computation in this case assumed that the variability of the opinions of the judges concerning the ability of an individual was approximately that of the so-called normal surface of frequency. Thus, 26 is ranked as lower-numbered than 34 by 6, as equal by 0, and as higher-numbered by 3. He is, by the assumption, .64 times the Median Deviation (P. E.) below 34, in the judgment of those who know the two. A table of differences corresponding to various divisions of opinion amongst 2, 3, 4, 5, 6, 7, 8, . . . n judges will be found useful. (Table III. is such a table up to 15 judges.) Table IV. gives the result of this series of computations¹. Where the values are negative, the first rough approximate order evidently needs amendment.

It is amended by comparing the wrongly placed individuals with other individuals near whom they seem to belong until, so far as possible, a place can be found for them such that they are, in every case, so placed as to give + differences or zero differences. In connection with this amendment, it will be useful to compute also the differences from the two or three next neighbors in the new order. For, if an individual is rightly placed, he will not only be below the one placed above him in the order, but also below the two or three next above him. A process of trial and adjustment will be more economical than a rigid procedure in this work. The result in the case in hand is as shown in Table V.

¹ Cases of no division of opinion among the judges, which theoretically correspond to an infinite difference, should be assigned values that are reasonable in view of the number of judges and the character of the facts judged.

TABLE I

THE RELATIVE POSITIONS, IN GENERAL INTELLECT, ASSIGNED TO CERTAIN INDIVIDUALS OF A TOTAL GROUP OF 34 BY EACH OF 18 JUDGES
Each Individual Judged is Represented by a Column. The Rankings of each Judge are Represented by a Row.

	1	2	3	4	5	6	7	8	9	10	11	12	14	15	17	18	20	21	22	25	26	27	30	31	32	33	34	35	36	37	38	39	40	42	
Judged by	2.	1	98	...	100	...	4	96	4	10	93	90	95	5	...	94	3	...	8	...	...	9	97	6	...	...	...	99	7	92	91	2	...	89
"	5.	8	...	97	99	90	96	...	79	...	93	...	83	91	88	98	89	...	...	...	...	80	95	86	87	85	...	...	94	84	...	81	100	...
"	6.	50	99	91	96	86	97	...	...	5	4	87	...	89	88	90	95	...	...	...	...	1	100	7	85	2	...	...	94	3	...	93	98	92
"	7.	1	100	...	98	...	84	97	82	83	92	91	95	85	81	96	90	...	86	93	87	80	94	...	...	...	89	99	3	88	...	2	...	...
"	10.	1	...	...	...	97	91	90	89	95	88	87	98	94	...	...	92	...	...	...	96	2	...	93	...	...	86	99	...	...	...	...	100	...
"	11.	14	99	93	100	88	91	92	1	86	90	89	97	87	13	12	11	...	5	6	3	2	...	95	8	94	9	98	4	...	92	85	7	96	10
"	12.	2	100	...	98	...	93	96	1	87	89	90	95	...	...	97	88	...	91	86	...	3	...	...	...	...	...	99	99	94	...	85	...	...
"	14.	3	96	95	94	92	90	97	7	6	9	93	...	8	12	99	92	...	89	...	...	...	...	...	...	...	...	98	5	...	...	1	100	...
"	18.	81	...	...	...	96	85	90	...	...	88	98	87	97	95	...	92	94	...	86	89	...	...	...	...	...	83	100	...	...	...	83	100	...
"	20.	1	96	...	99	...	...	...	...	...	8	4	...	5	6	94	2	99	93	...	...	95	...	3	...	...	100	7	...	...	...	92	97	...
"	21.	3	96	...	98	...	...	...	...	...	...	6	94	7	...	94	4	99	95	8	...	1	91	2	...	9	5	100	...	10	...	97	...	...
"	27.	1	96	...	99	7	90	92	3	...	...	90	89	88	2	97	4	98	95	94	9	12	...	91	10	6	11	100	6	...	8	93	5	...
"	30.	1	...	...	...	90	...	94	...	...	5	95	...	...	...	5	...	...	...	...	3	2	98	97	4	7	93	...	...	...	...	...	100	...
"	31.	1	96	88	99	87	95	86	2	9	12	3	13	94	4	91	92	98	7	11	8	6	97	93	90	99	5	99	10	...	93	3	100	...	
"	32.	5	94	...	99	...	100	...	...	...	92	88	89	...	87	...	90	91	...	85	...	2	1	98	97	85	86	93	95	...	86	3	4	...
"	33.	1	85	97	96	...	94	3	5	90	7	8	...	93	89	98	86	87	99	84	6	95	92	84	4	100	11	88	12	91	2
"	35.	5	100	...	...	1	...	98	...	...	93	...	98	...	...	96	4	...	6	7	...	3	...	2	...	95	...	...	...	...	97	...	99	...
"	40.	2	94	...	3	6	...	...	...	...	8	...	7	4	89	...	99	92	95	...	...	5	94	98	...	...	100	1	...	91	96	...	97	...

TABLE II

THE FACTS OF TABLE I. REARRANGED IN AN APPROXIMATE ORDER BY INSPECTION. Each Individual Judged is Represented by a Column.
The Ratings of each Judge Are Represented by a Row.

	35	4	2	40	7	20	3	6	17	12	30	27	10	21	31	32	38	5	18	11	33	39	22	14	42	37	9	25	15	36	1	8	34	26	
Judged by 2.	99	100	98	...	96	...	...	4	94	95	6	97	93	8	...	...	91	...	3	90	...	2	...	5	89	92	10	...	...	7	1	4	...	9
" 5.	94	99	...	100	97	96	98	86	95	93	...	87	85	...	90	89	...	81	92	91	88	84	8	79	...	80
" 6.	94	96	99	98	...	...	...	91	97	90	...	7	100	4	...	85	2	...	86	95	87	...	93	89	92	...	5	...	88	3	50	...	1	
" 7.	99	98	100	...	97	...	...	84	96	95	...	94	92	86	...	...	...	...	90	91	...	2	93	85	...	88	83	87	81	3	1	82	89	80
" 10.	99	...	...	100	90	...	...	91	...	98	93	...	88	...	...	...	...	97	92	87	...	...	...	94	...	...	95	96	...	...	1	89	86	2
" 11.	98	100	99	96	92	...	93	91	12	97	95	...	90	5	8	94	...	88	11	89	...	7	6	87	10	...	86	3	13	4	14	1	9	2	
" 12.	99	98	100	...	96	...	...	93	97	95	...	...	89	91	...	...	92	...	88	90	...	85	86	...	...	94	87	...	...	2	1	...	3	
" 14.	98	94	96	100	97	...	95	90	99	...	...	...	9	...	...	...	...	92	92	93	...	1	89	8	...	...	6	4	12	5	3	7	...	...
" 18.	100	96	...	100	...	...	...	90	92	97	93	...	98	86	...	...	82	...	85	94	87	...	84	89	95	...	...	88	...	91	81	...	84	...
" 20.	100	99	96	97	...	99	...	...	94	...	...	95	8	93	3	...	...	...	2	4	...	92	...	5	...	...	...	...	6	7	1	...	...	...
" 21.	100	98	96	97	92	99	...	...	94	94	2	91	...	95	...	9	10	...	4	6	...	...	8	7	...	...	...	...	...	3	...	...	5	1
" 27.	100	99	96	5	92	98	...	90	97	89	91	...	...	95	10	6	8	7	4	90	...	93	94	88	...	...	...	9	2	6	1	3	11	12
" 30.	...	90	...	100	...	...	...	94	...	...	97	98	95	...	4	7	...	...	5	...	...	...	...	...	...	...	5	3	...	...	1	...	93	2
" 31.	99	99	96	100	86	98	88	95	91	13	93	97	12	7	90	89	93	87	92	3	...	3	11	94	...	...	9	8	4	10	1	2	5	6
" 32.	95	99	94	4	...	...	...	100	90	...	97	98	88	85	85	96	86	...	91	89	...	3	...	87	...	...	92	2	...	5	...	93	1	...
" 33.	100	96	85	91	3	98	97	94	...	...	6	84	7	86	95	92	88	...	89	8	84	12	...	93	2	11	90	87	...	...	1	5	4	99
" 35	...	...	...	100	99	98	...	...	96	98	2	...	93	6	...	...	95	97	1	4	...	...	7	...	...	...	...	...	...	...	5	...	...	3
" 40.	100	3	94	97	...	99	...	...	89	...	98	94	8	92	...	...	...	91	6	...	...	96	95	7	...	...	...	...	4	1	2	...	...	5

TABLE III

THE DIFFERENCES IN TERMS OF THE MEDIAN DEVIATION CORRESPONDING TO ANY GIVEN DIVISION OF OPINIONS AMONG 2, 3, 4, 5, 6, . . . , 15 JUDGES
 N=No. of judges; D=Nature of the division among the judges; Δ =Corresponding difference in terms of the Median Deviation (P. E.).

N	D	Δ	N	D	Δ	N	D	Δ
2	2-0	∞	8	8-0	∞	12	12-0	∞
2	1-1	0	8	7-1	1.71	12	11-1	2.05
3	3-0	∞	8	6-2	1.00	12	10-2	1.43
3	2-1	.64	8	5-3	.47	12	9-3	1.00
4	4-0	∞	8	4-4	0	12	8-4	.64
4	3-1	1.00	9	9-0	∞	12	7-5	.31
4	2-2	0	9	8-1	1.81	12	6-6	0
5	5-0	∞	9	7-2	1.13	13	13-0	∞
5	4-1	1.25	9	6-3	.64	13	12-1	2.11
5	3-2	.38	9	5-4	.21	13	11-2	1.51
6	6-0	∞	10	10-0	∞	13	10-3	1.10
6	5-1	1.43	10	9-1	1.90	13	9-4	.74
6	4-2	.64	10	8-2	1.25	13	8-5	.43
6	3-3	0	10	7-3	.78	13	7-6	.14
7	7-0	∞	10	6-4	.38	14	14-0	∞
7	6-1	1.59	10	5-5	0	14	13-1	2.17
7	5-2	.84	11	11-0	∞	14	12-2	1.58
7	4-3	.26	11	10-1	1.99	14	11-3	1.17
			11	9-2	1.35	14	10-4	.84
			11	8-3	.89	14	9-5	.54
			11	7-4	.52	14	8-6	.26
			11	6-5	.17	14	7-7	0

We may now proceed to correct this amended order by assigning each individual an amount of difference from individual No. 1, using the comparison of him with each of his four neighbors (in the direction of No. 1) in Table V. Thus No. 8 is 1.25 from 1, No. 26 is .64 from 1 by direct comparison, and 2.38 via No. 8, and averages 1.51. No. 36 is .89 from 1 by direct comparison, and 2.09 via 8, and 1.51 via 26, and averages 1.50. No. 15 is theoretically an infinite distance from No. 1 by direct comparison. Call this, in view of the small number of the judges concerned, 2.00. No. 15 is 1.89 from 1 via 8; 1.77 via 26; 2.14 via 36. It therefore is on the average 1.95. No. 25 is 2.84 from 1 via 8; 2.51 via 26; 1.12 (1.50-.38) via 36; and 2.33 via 15. It therefore averages 2.20. The resulting distances of each individual from No. 1 are as given in Table VI.

The use of three indirect measures, rather than one or two or four or five, is arbitrary. The estimate could be made more reliable by weighting each comparison according to the square-root of the number of judges represented by it. The resulting order should not without some consideration be used instead of the order derived from comparison with next neighbors only; for the next-neighbor comparison, though not utilizing the data fully, is simple and unambig-

TABLE IV
THE DIFFERENCES BETWEEN SUCCESSIVE INDIVIDUALS IN TABLE II., ON THE BASIS OF DIRECT COMPARISONS.
1.00 = THE MEDIAN DEVIATIONS OF THE OPINIONS OF N JUDGES CONCERNING ANY GIVEN INDIVIDUAL

	34	8	1	36	15	25	9	37	42	14	22	39	33	11	18	5	38	32	31	21	10	27	30	12	17	6	3	20	7	40	2	4	35
26	.64																																
34		-.64																															
8			-1.25																														
1				.89																													
36					.64																												
15						.38																											
25							1.00																										
9								1.00																									
37									-∞																								
42										.00																							
14											-.64																						
22												-1.13																					
39													.43																				
33	(The data are inadequate for measuring the differences of No. 33.)																																
11																																	
18																																	
5																																	
38																																	
32																																	
31																																	
21																																	
10																																	
27																																	
30																																	
12																																	
17																																	
6																																	
3																																	
20																																	
7																																	
40																																	
2																																	
4																																	
35																																	

THE DIFFERENCE BETWEEN NEIGHBORING INDIVIDUALS, ON THE BASIS OF DIRECT COMPARISON. 1.00 = THE MEDIAN DEVIATION

	8	26	36	15	25	34	9	43	14	37	39	33	31	18	5	11	21	23	10	35	30	6	12	7	3	17	27	2	40	4	20	35		
34 1	1.25	.64	.89	∞	1.13	1.90																												
33 8		1.13	.84	.64	1.59	.64																												
32 26			.00	.26	1.00	.64																												
31 36				.64	-.38	.38	.84																											
30 15					.38	1.00	.38	.00	1.13	∞																								
29 25						.47	1.00	.00	1.00	.00																								
28 34						.47	.00	1.13	.00																									
27 9							.00	.78	1.00	-.131																								
26 42							∞	.00	.64																									
25 14								.00	.64	.74	-.64	∞																						
24 37										1.00	?	?	?	.00	?	1.00		.00																
23 39											.47	.47	1.51	.47	.43																			
22 32												.47	-.17	.26	-.47																			
21 31														.64	.38	.84	-.32																	
20 18															.00	.26	.00	.00																
19 5															.84		.64	.47	.21															
17 11																	.17	.47	.31	.84														
16 21																		.64	.52	.64	.00													
15 22																			.64	.64	.00	1.00												
14 10																				.47	.31	1.00	1.13											
13 38																					.23	1.43	1.43	.84	1.81									
12 30																						.00	.64	.00	.38									
11 6																							.64	.64	.64	.52	.47							
10 12																								.42	.64	.19	.38							
9 7																									1.00	.21	.38	1.90	1.71		∞			
8 3																																		
7 17																										.38	.00	1.25	1.43	.64	∞			
6 27																											.64	1.43	1.43	1.59	∞			
5 2																												.43	1.13	.89	∞	1.00		
4 40																													.43	∞	.64	.15		
3 4																														.17	-.14	1.43	.15	
2 20																															.32	.40	∞	

nous in its meaning. Perhaps some simple system of overweighting the next-neighbor comparison would be advisable. On the whole, however, we have in this technique an economical and fairly reliable means of combining partial orderings.

When the number of judges represented in a comparison is large there is less need of making the final correction by indirect comparisons. When the number of judges is small it may be well to compare *viâ* five or six near neighbors.

TABLE VI
DIFFERENCES OF EACH INDIVIDUAL FROM THE LEAST INTELLECTUAL, No. 1, IN
TERMS OF THE MEDIAN DEVIATION OF THE OPINIONS

Individual	Distance Above No. 1	Individual	Distance Above No. 1
1	0	21	4.02
8	1.25	22	4.30
36	1.50	10	4.44
26	1.51	30	4.54
15	1.95	38	4.84
25	2.20	6	5.39
42	2.31	7	5.61
34	2.41	12	5.76
9	2.69	17	6.08
39	2.90	3	6.24
32	2.94	27	6.27
14	3.13	2	7.30
37	3.55	4	7.48
5	3.76	40	7.51
18	3.84	35	8.52
31	3.98	20	8.58
11	4.00		

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ETHICS AS SCIENCE AND AS ART

I

ALMOST any undertaking may be and has been described as a science, just as almost any one may and does call himself a professor.

When I propose to consider ethics as a science it is in the narrowed sense of "ordered knowledge of natural phenomena and of the relations between them." I have in mind also (a) the saying of Svante Arrhenius that "science implies measurement," (b) the practise of experimental research instituted by Francis Bacon, and (c) Galileo's

practise of searching for the "how" rather than the "why" of things.

We need no account of scientific method. All the educated world knows what it is and admires its efficacy. It has had its hard days in the past when its devotees were not only treated as impious, but were even destroyed in various delicate ways. But why consider that that which is "the ordered knowledge of *natural phenomena*" can possibly be applied to ethics? There's the rub! for ethics has, heretofore, been forbidden territory to science.

Now the various natural sciences, such as physics, chemistry, geology, biology, etc., have all had their theological and metaphysical stages before they emerged into the positive stage. Every science is *ipso facto* positivistic and naturalistic. There is, however, a positivistic temper against which philosophers and theologians have justly protested. It is the temper of that science which does not recognize the rock whence it is hewn; for all the sciences have been gradually separated from the more inclusive if less defined discipline known as philosophy. The natural sciences are taught in many places to-day as natural philosophy, and it were well that we should always recognize the significance of this connection.

Physics and chemistry, as the most exact of the natural sciences, and hence the most dogmatic, are quite apt to forget their origin and to overlook the fact that they are based upon unproved assumptions. Their deeper questions are still questions for philosophy. Still, one must acknowledge that, so long as they were under the tutelage of theology or metaphysics, they made little progress; and the same may be said of the more recently emancipated sciences, which, moreover, tend to split up into subordinate sciences. Thus general biology divides into zoology and botany, physiology, psychology, psychiatry, etc., and each of these in turn becomes more productive when it has set up a household of its own. There are problems in each of the sciences which remain philosophic problems—some would say, chiefly because they are unsolved. Be it so. There are many soluble problems in ethics, I believe, and it is to those that I would see men turn their attention to-day.

II

Now many writers on ethics have spoken of it as a science; but they have not treated it as such. Many have added greatly to our exact knowledge in ethical fields who yet have not submitted the entire subject of ethics to scientific method. Some recent writers have been intensely practical in their applications of ethics and franker on some biologic subjects than any one heretofore, who are yet quite unscientific in their total attitude.

The only writer, whom I know, who has proposed a strictly scientific programme for ethics—if we except Comte, on account of his

general attitude—is, significantly enough, L. Levy-Brühl.¹ In his book "Ethics and the Science of Morals"² he proposes a plan of study to which I can give almost unqualified adhesion; though I would supplement it in significant ways. Durkheim³ is a kindred spirit. It is noticeable that Levy-Brühl and Durkheim, for all their great vogue in Europe and the profound influence of the latter on sociology, both in Europe and in the United States, are practically unmentioned in contemporary ethical literature. In the *International Journal of Ethics*, during the entire period of its existence, I can find but two brief and inadequate reviews of their works which are by men of recognized power, but which present a totally new viewpoint in ethics.

Of course, the work of all the sociologists has contributed enormously to ethical illustrative material; and a deceptive appearance of scientific method is thus often given to ethical writing. But a true science does not assume its principles *a priori*; nor does it hang on, like grim death, to its hypotheses when they have proven absolutely unfruitful.

"Ethics," by Dewey and Tufts, is the most nearly an actual scientific treatment of the subject in its entire history. Its three sections are an introductory sociological section, then the theoretical treatment, and finally what might be called a programme for social reform. But even this work is not *avowedly inductive and naturalistic*. Its object was not to make a distinct contribution to the new science of ethics, though it does indicate the way in which such a science may be approached, and there is nowhere any hostility toward the idea that ethics may be a science in the naturalistic sense.

Westermarck⁴ has proposed "to study moral consciousness as a fact." Sutherland⁵ has written of the genesis of morality. Professor Sharp⁶ has done valuable work in casuistical studies. None of them, I think, has initiated a real science of ethics, though scientific method has been used by all, and all have gathered valuable material which the new science not only may, but must use.⁷

¹The biographer of Comte.

²Translation by Elizabeth Lee. Archibald Constable and Company. London. 1915.

³Emile Durkheim, "De la division du travail social." Cf. also my article in this JOURNAL, Vol. X., page 337, "The Case Method in the Study and Teaching of Ethics."

⁴Edw. Westermarck, "The Origin and Development of the Moral Ideas."

⁵A. Sutherland, "The Origin and Growth of the Moral Instinct."

⁶F. C. Sharp, "A Study of the Influence of Custom on the Moral Judgment." *Bulletin of the University of Wisconsin*, 1908.

⁷John Stuart Mill has, in Book VI. of his "System of Logic," proposed a science of human nature, which resembles in many ways the pro-

III

The greatest obstacle in the way of a scientific study of ethics is its usual classification, with logic and esthetics, as a normative science.⁸

Now the course of the centuries has seen the production of not one, but many sciences of ethics on this basis, which is to say, no science at all. If by normative we mean merely *ideal*, then we may ask whether our science does not become at once an art. The standards are somehow already at hand. All that remains is to apply them in the best and most practical way. But if it is a question how men come to have these various standards, these "types of ethical theory," then we have a genetic inquiry to begin with and we may, by classification, formation of hypotheses, experiment, etc., form a true science of ethical theory, as we may have a science of anything whatsoever.

But, I take it, this is not the meaning of those who protest against ethics as a natural science and claim that it is rather normative. Their protest is against the intrusion of the naturalistic method at all. Seeing the absolutely imperative character of the standard when achieved or realized, it is conceived to have a Minerva-like directness and timelessness of source. This is deceptive. Norms are in all essential respects attained in the same fashion as natural laws. The mere fact that the norm says "ought" and the law says "must" does not wholly differentiate them. The natural science method is as applicable to the discovery of the growth of norms as it is to the discovery of laws, though it is true that the individual or group cognizant of these norms has not attained them by an inductive process. It has them, and then it attempts to justify them. It is just my contention that a disinterested inductive study is essential to the discovery of the "how" of their acquisition. One may observe likewise that the "norms" of physics are as imperative to the intelligence as the norm of ethics is to the will.

The name "science" is not trade-marked; and we may speak of Christian science and normative science if we wish; but these are not natural sciences, and neither of them claims to be such. The charposals of Levy-Brühl and Durkheim. He reserves for ethics, however, the narrower field of art or practise. His science of ethology "may be called the exact science of human nature." A careful study of this Book VI. will be invaluable in connection with a science of ethics.

⁸ Rashdall, "Theories of Good and Evil," Vol. II., page 414. "Logic, esthetic, and ethic are sometimes spoken of as normative sciences, i. e., sciences which set up standards or which deal not simply with what is, but with what ought to be. They determine the principles upon which we distinguish between the true and false, right and wrong, judgments about the true, the beautiful, and the good."

acteristic of a normative science is that its principles are postulated. It makes no difference whether one be an intuitionist, a utilitarian, or an evolutionary moralist, since these, however different in other ways, are alike in their method of acquiring the initial position.⁹ They get it *a priori* every time; and it is not surprising that, after the lapse of twenty-five centuries, the different theories are no nearer together than they were at their separate beginnings.

Wundt,¹⁰ recognizing "the universal applicability of the purely descriptive standpoint to all departments of human knowledge" to be unquestionable, says, "we should still take into consideration that the estimate of the value of facts is also itself a fact and a fact which must not be overlooked when it is there to see. A necessary condition of any such estimate is the existence of human free will. By free will we mean here not a metaphysical faculty, but merely the empirically given capacity of choice between various actions." *Faites vos jeux, Messieurs!* Here we are again! I suppose that we shall never rid ourselves entirely of this Old Man of the Sea; but he must be locked up, temporarily at least, if there is ever to be any progress in moral science. More of him, later, when we touch upon "The Freudian Wish" of Professor Holt.

"A normative science or a science of human norms"—what can these words possibly mean? If we have our norms to begin with, there will be nothing left except application of them, and all ethics will become casuistry. But if norms are, as Wundt implies, very much like natural laws, obtained in the last analysis in the same way, one can not possibly have any objection, scientific though his temper may be, to norms as such.

Every man who has studied the historical ethical systems must have felt a sympathy with them all. Each has made some contribution of great worth, and the normative character of ethical standards

⁹ E. Durkheim, "De la division du travail social," page 18. "Il est évidemment impossible qu'on puisse jamais trouver la loi qui domine un monde aussi vaste et aussi varié, si l'on ne commence par l'observer dans toute son étendue. Est-ce ainsi que procèdent les moralistes? Tout au contraire, ils croient pouvoir s'élever à cette loi supérieure d'un seul bond et sans intermédiaire. Ils commencent par raisonner comme si la morale était toute entière à créer, comme s'ils se trouvaient en présence d'une table rase sur laquelle ils peuvent à leur gré édifier leur système, comme s'il s'agissait de trouver, non une loi qui résume et qui explique un système de faits actuellement réalisées, mais le principe d'une législation morale à instituer de toutes pièces. *A ce point de vue il n'y a pas à distinguer entre les écoles. L'argumentation des empiristes n'est ni moins hâtive ni moins sommaire que celle des rationalistes: la maxime de l'utile n'a pas été obtenue plus que les autres à l'aide d'une méthode vraiment inductive.*" (Italics mine.)

¹⁰ W. Wundt, "The Facts of the Moral Life." (Transl.) Page 5. Swan, Sonnenschein, and Company. London. 1897.

is beyond question. The final command is "ought," not "must." That, among other things, differentiates ethics from physics; but man does not respond to the "ought" any more invariably than he does to the "must." When he fails to respond, he suffers remorse—perhaps—but often no other penalty; when he tries to disobey the physical law he is *invariably* injured or destroyed. The physical law holds for all men; the particular ethical law holds only (and as just indicated) for those who accept it; others violate its provisions with impunity except where these coincide with the principles of all other ethical systems. And, in this case, we hold, in agreement with Wundt, that these provisions have the character of a natural law.

It would be rash and impertinent to say that all ethical speculation in the past had been fruitless; but it might be ventured that whatever merit the ethical systems of the past have had is owed rather to the necessary reactions of men in society than to the wisdom of ethical principles intuited by brilliant minds. One does not make a man any better by explaining hedonism to him nor any more virtuous by letting him discover that he is a natural intuitionist. And the curious fact has often been pointed out that, under Stoic and Epicurean, with quite opposite and contradictory theories, there were almost identical practical principles of action; that is to say, an Epicurus or an Aurelius would have advised the young to do practically identical things.¹¹ The reason for this is evident. *Their practical rules do not grow out of their initial principles, but are rather the result of an unnoticed inductive process carried on by all men, which has its fruits in the practical wisdom of action of the most unphilosophic.* It has been suggested to me that, however similar Stoic and Epicurean may be in their practical conduct, there are none the less ethical ideals which lead men to widely different conduct, e. g., St. Augustine and Walt Whitman not only led different lives, but these lives were the legitimate outcome of their ethical philosophy. This is perfectly true. There are some consistent men in the world! And for all Emerson's contempt of it, consistency is a very great and unusual virtue.

I have not meant to imply that all ethical systems were fundamentally the same and would legitimately eventuate in the same conduct. I believe that there is *some* ground common to them all; but this is not the place to explain why I so believe.

"The normative method," if one may use such an expression, is characterized by a great deal of hypostatization. Such terms as "the right," "the good," "justice," "duty," "freedom," are

¹¹ I do not fail to recognize that stoicism has usually been a social preservative, whereas the deliberate adoption of epicurean principles has usually been followed by degeneration. Offset this by the noble life of Epicurus himself.

of frequent occurrence. Ideal standards of conduct are planned which *might* be possible if all beings (upon whatever metaphysical basis conceived) were themselves perfect to begin with, but which become grotesque when we realize that they are to be carried out by people who have imperfect bodies, faulty heredity, and a reluctant environment. No one but Kant (and a few of his sternest spiritual mates) has ever promulgated the doctrine that one must do "the good" even if all results of so doing were manifestly bad; and Kant had to take refuge in an unrealizable world in order to escape the charge of utter unreason. The doctrine that nothing is good but the Good Will leads straight to antenomicism. Its potency is all destructive.

And, even if men could agree on some one of the many historical ethical theories, how far would this advance us on our difficult way of finding out *how to behave wisely in society*? For this, I take it, is our ultimate object. It is always possible to consider ethics a branch of esthetics, and there are those who limit ethics entirely to its esthetic side. Now it may be that they are right. In any case one would by no means exclude this possibility from his investigation. That would be to become partisan and propagandist at the start. Still there can be no protest against the assumption that ethics deals with the conduct of men in society and that the chief object of it, scientific or dogmatic, is to improve the condition of man, to make society both more rational and more happy. Now every historical ethical theory has contributed something of final value. A society dominated by any one of them would be dignified and worthy: but in the case of intuitional systems, at least, it would certainly be static; and, if evolution and the Heracleitan tradition of constant change have taught us nothing else, they have convinced us that no principles which are not susceptible of constant adaptation to new conditions can possibly be of the maximum value. And so we reject the normative ethical tradition *en bloc* as essentially unfitted to our purpose.

But, aside from the difficulty of choosing between the various normative ethical traditions, and aside from the objection just made that the normative is frequently static, there remains the possibility that there may be *no one* universal basis of ethics. The common prejudice that there must be a universal law of conduct, a position stated most unequivocally by Kant, is probably closely connected with the nearly universal monism which characterizes the general public even more than the philosophical world. Without declaring for monism or pluralism, the *possibility* that our investigation may lead to the latter, must be foreseen; and, in that case, we may be certain that there can not be any universal rules of conduct, but that conduct will

always have to be adapted to the special conditions under which men live. Moreover, there will not only, possibly, be many ethical standards, but none of them will be static. Men hate change almost as much as they love it, and it is a risky business to announce beforehand that there *may be* no absolute abiding-place for the soles of our feet; but the quest of the scientific in ethics is not for the timid.

IV

One of the few reviews of Durkheim describes his work as nominally sociology, but actually ethics; and it is a common objection to the case method that it is nominally ethics, but actually sociology. There is no need to be disturbed by criticisms so little integrated. "The way to resume is to resume," said a trenchant personality of specie payment, after the Civil War. The way to make ethics a science is to begin the work. The writer of this paper is now preparing a Case Book in Ethics as an imperfect and modest contribution to such a science as he conceives ethics to be. He proposes to publish some preliminary groups of cases very shortly in this JOURNAL, upon which he will ask the most searching criticisms; and he will be equally indebted for criticism upon the programme here set forth as well as for any supplementary conceptions for such a science. A certain vagueness and formlessness is inseparable from such beginnings and must be anticipated and forgiven. Nothing could have seemed a more unlikely subject for science than the weather; yet to-day meteorology is greatly respected and growing in usefulness.

This science of ethics will make great use of sociology with its tremendously valuable and significant array of facts about the influence upon conduct of geography, of race, of climate, of economic conditions; with its statistical method so admirably developed. The embryo sciences of criminology and penology, offspring of sociology, will be especially valuable, but none of these is ethics. *The nature of a science is determined, not by its material, but by its purposes.* All sciences must study bodies; there is nothing else for them to study. Science is necessarily materialistic *qua* science. For it the classic rule is Hobbes's "All that exists is body; all that occurs is motion." But this materialism must not be misunderstood. It is not the final philosophic word, it is only a method; and this method can apply only to bodies. Ethics will study the *attained results* of sociology and like sciences in order to know how individual men—not their wills or personalities, but the men as organisms,—act upon one another; and also how various groups—not their principles avowed or tacit, but the groups as groups—act upon one another. We want to find out what the individual Thomas Brown did to John Smith under various conditions, what France did to England, or the United States to

Panama; and this in their total relations, for, as has recently been said of biology, the entire organism must be considered.

We want also to find out what were the judgments of the group to which they belonged, for the purposes of the judgment, through the recognized authorities of that group.¹² *Every group to which any man belongs has already, in some fashion, formulated its definite ethical standards*, whether those of church, state, municipality, or of family, race, or merely a social or political club. Any infraction of these standards is an offense against the group and is punished, as any signal devotion to them is rewarded, in a conspicuous fashion. These judgments, for the state, are formulated in the decisions of courts; and law to-day is not only studied, but taught by the consideration of these particular judgments. At least it is so taught in the United States. Any widespread scientific consideration of ethics, however, must not only study cases as in the United States, but it must also study the judgments made in those countries where the Roman Law is the model rather than the Common Law of England and her dependencies. There is an evident analogy between the method of the Roman Law and the method of intuitionist ethics. The case system in ethics must follow, primarily, the case system in law of this country. *Its use of cases*, however, will be for a quite different purpose. It will not be concerned to differentiate between first and second degree murder, between burglary and larceny, between grand and petit larceny, between arson and accidental burning, etc.; *it will not deal with procedure at all*; but, taking the identical facts in each case from the law records, it will seek simply to show exactly what happened, in what the offense consisted, what the authorities said about it, how far they held the person responsible for his actions and exactly what penalty was imposed. Cases should be taken chiefly from records of higher courts in order to avoid the obvious objection that many decisions of lower courts are reversed and are never considered to be *law*.¹³ These cases will be grouped by similarity of offense and conditions; and great care will be taken to indicate whether a judgment was made a few centuries ago or at present, whether in England or America, whether in Massachusetts or in Arkansas, whether in a community dominated by strong religious or racial feeling or not, whether during times of war, or threat-

¹² Cf. my first article on this subject, "The Case Method in the Study and Teaching of Ethics," this JOURNAL, Vol. X., page 342. There are statements made in that article about aim and method which I have not thought it necessary to repeat here.

¹³ Cf. my article "The Case Method in Ethics and its Critics," this JOURNAL, Vol. XI., page 20. Any judgment of any court is actually *law* in some sense.

ened war, or in times of peace. From law cases alone much is to be learned of those principles *which actually do govern men in society*.

But a supplementary and more difficult field is to be investigated next; more difficult, not in essence, but because, in it, it is harder to get at the facts. I refer to the judgments of groups whose records are not carefully kept and are not open to the public, such as the actions of corporations, of churches, of educational institutions, of families, of private clubs, and loosely knit social or political groups. These are not compelled by any law to keep accurate records. When some action of theirs is of so serious a nature that they are sued, either by federal authorities or by private persons, their records are often found to be incomplete or to have disappeared altogether. Officers prove to have faulty memories. "I don't know" is a frequent answer to questions; and the suspicion in the minds of court and general public that the man is lying has no immediate cogency because it can not be justified. Groups of all kinds, through their appointed officers, frequently give no reasons at all for their actions, denying the pertinence of an inquiry, or else assigning reasons evidently false, but not provably false.

These are difficulties, but they are not greater than the difficulties which anatomy, physiology, and histology have to face, and these latter have successfully surmounted many of their obstacles. Then, finally, there are the loose, floating, intangibles; like gossip, "public opinion," etc., which are chiefly valuable as clues, since they can not be presented in evidence.

I have elsewhere called such a study as this, *the physics of ethics*. *The study of cases of conduct, as above outlined, must, in my judgment, form the core of any future scientific ethics. It is the proper beginning and logically precedes other studies contributory to such a science.* Such a study of cases by no means excludes the work of Professor Sharp which, while casuistical in character, is yet always dealing with actual cases referred to the tribunal of the conscience, rather than to any external authority or power. The authorities of groups generally mete out the same rewards and punishments to members, regardless of their ethical standards or ideals. The theory is that this is always done, men are equal before the law; but in fact there are many exceptions. For example, Quakers are nearly always excused from military service or police duty while no such tenderness is shown to Presbyterians or Methodists.

Next in importance comes the study of biological facts—not, necessarily, of biology as such. Suppose that one has some ideal of human conduct, such as Jesus or Socrates or the Magnanimous Man of Aristotle or the Stoic Gentleman, and wishes, not only to conform his own life to it, but also to bring about an approximation to it on

the part of society. He has been brought up under a psychology which assumes a *will*, separable from the body and not subject to the laws of the body. He assumes that such a will can be changed by appeals, by the force of example, by submission, turning the other cheek, etc.; and there is just enough truth in these generalizations to make them plausible.

Now let such a man make a comparative study of the nervous system. He will discover that there can be no action and no thought, since thought is an action too, without a definite reaction of the nervous system to a stimulus which must always be *initiated* from without the organism.¹⁴ Moreover, while all human organisms are more or less alike—in fact, very much alike—nevertheless there are characteristic differences between them; and, given the same stimulus, there will inevitably be different reactions—including thoughts—especially if one or other of these nervous systems be abnormal.¹⁵ He will find that, if there are certain lesions of the brain, or certain diseases of the spinal cord, there are whole ranges of action—and thought—utterly impossible to the being thus afflicted. This is not imagination; the psychopathic wards of our hospitals are teeming with corroborative material. And, so far as I know, there is no remedy for any affliction with such a basis.

The bearing of such facts as these upon a science of ethics, upon questions of *what duty and responsibility are*, is all too plain. But, some one may object, we have always held free from responsibility the very young, idiots, and the insane. There is nothing new in this. No, nothing essentially new, in very truth! It is strange, however, that so few have ever considered its significance. It has been there to see for centuries; but now, the careful observations of responses to particular situations, coupled with minute autopsies of the unfortunate, have made it plain to the meanest intelligence that *there are hundreds of thousands of human beings who can by no possibility ever do what is expected of them by society*. Society must give over expecting such things.

Compare now, with such facts as the above, the equally striking facts uncovered by sociological plus biological studies of the effects of heredity and the possibilities of eugenics. Take the hackneyed comparisons of the Juke family with its terrible fruit of criminals, prostitutes, and degenerates to several generations and the Jonathan Edwards family with its glorious fruit of scholars, publicists, phil-

¹⁴ More exactly, from without the nervous system. The initiated will not need to be told what I mean and I do not want to clog the argument with an explanation here.

¹⁵ I am omitting, for the sake of clearness again, any reference to the influence of the total organism; but this can not be omitted in any complete account of the matter.

anthropists, successful and honored men of affairs, and one sees why some men are praised and exalted and others are abased. The working out of the Mendelian law is one of the most significant things in the history of biology, an apparently inexorable process is indicated. The theory that, by an appeal to the will or by the grace of God, the meanest wretch may turn to a life of righteousness and honor, vanishes in thin air. One's ideal of righteousness may indeed remain what it was before, but will not expectation that either he or any one else can do more than approximate it disappear altogether? And will not his theory of the nature of responsibility have been perceptibly modified, whether he be a utilitarian, a hedonist, or an intuitionist?

The modern comparative study of religion and of religious psychology has brought to light many facts of great importance for a science of ethics. It is quite apparent that, however different men's reactions may be to the same stimulus, yet, given a group training of one kind, it is quite as easy for men to grow up with the religious ideas of Mohammedanism, Buddhism, Christianity or Paganism, to be Presbyterians or Roman Catholics or Jews; and that the consciences of men are dominated by the traditions in which they have been bred. One finds criminals and saints among all these classes. Their consciences justify them according to the religious, ecclesiastical, political, or social traditions of their environment.

This is the proper place for the study of casuistry—as objective as any study, under right conditions. But, again it may be objected, the “normal man” will act always and can act always, according to duty. Who is the “normal man” and how is normality to be determined? Some one (was it Pascal?) once shrewdly remarked, merely from observing mankind, that we were all a bit mad at times. There is more than a little truth in this statement. And the studies in recent years by Professor Theodore Flournoy, of Geneva, and Dr. Morton Prince, of Boston, on multiple personalities, show how abnormality of still another kind may be found even in those whose nervous systems are not overtly diseased or defective.

Enough has been said to indicate the fields in which we may look to find new material for a scientific investigation of the problems of duty and of obligation; for it must never be forgotten that ethics deals primarily with such problems. Ever since man has been rational at all, he has learned not to hold responsible any one who could not help himself. Even the law, with all its rigidity and apparent brutal indifference to capacity, has recognized in principle, and in occasional practise, that some people could not be punished by the state because, in strict fact, they were not *persons*. And now we are learning that the number of those who are, either at times or all the

time, irresponsible, is enormously greater than we had suspected. The discussion of what to do with them belongs under Ethics as an Art, to which we now turn.

V

The ancient controversy over the relation between the theoretical and the practical will not be here revived. It is a dead issue nowadays for all but a very few. All men recognize that the pursuit of "pure science" has brought in its wake untold practical blessings to the world; and most men agree that it is by the pursuit of "pure science" without ulterior commercial motive, that we are most likely to get these blessings. The dispute is settled by the discovery that there is no possible separation of the theoretical and the practical except in a purely formal way. Theory always eventuates in practise, practise becomes dull and inoperative unless constantly vivified by theory; and, moreover, it always proceeds upon some theory.

Scientific ethics is, potentially, applied ethics. Mankind would be very little interested in ethics if such a study were not expected to have very definite practical effect in influencing the conduct of men in society. The Robinson Crusoe-Alexander Selkirk kind of speculation regarding the possible morals of a solitary being who must always remain solitary, is idle and vain. It may be left safely to those who like it.

Now, given the ethical theory of any people, race, state, or church; these have not done so badly in application. The "line upon line, line upon line, precept upon precept, precept upon precept, here a little and there a little" plan is admirably effective—up to a certain point. The force of example, leading to imitation; the power of secret orders, and the influence upon the imagination of initiations, sacraments, and decorations, the importance of taking men while they are young and plastic if one would mold them to any pattern,—these have all been well known, though not scientifically known, to the past ages.

There are many practical devices for influencing men to follow any particular ethics, which grow out of the studies indicated in section four, above. There are—according to the newspapers!—operations upon the skull which turn criminals into honest men. The thing is at least plausible. The mere investigation, by competent school physicians, of the physical condition of children, with especial reference to sight, hearing, and the presence of adenoids, is worth much moral preachment and persuasion; and is more generally effective. The study of the hookworm disease¹⁶ and the campaign for its eradication by the Rockefeller Foundation have moral consequences

¹⁶ For a statement regarding the beneficial effects of biological study, see the presidential address of Dr. C. W. Eliot in *Science*, December 31, 1915.

absolutely incalculable and all for good; if we do not criticize the accepted standards of our generation, probably they are for good on any standard.

But by far the most important agency for bringing about any scheme of ethics already existing and accepted is that which is revealed in Professor Edwin B. Holt's little book, "The Freudian Wish." This book contains a good deal of Freud and more of Holt, while the combination strongly suggests Avenarius. *The mechanism of the will is clearly revealed.* The method by which the will may be trained and modified is brought into the light of day and shown to be in perfect harmony with what has been intuited by the best minds of the past. The old phrase, "As a man thinketh in his heart, so is he," is shown to have neural and muscular basis. The ancient conception of the will as something entirely apart from neural paths, motor tendencies, and bodily "sets," is overthrown. Incidentally, there is much light shed upon the problems of choice; the idea of unmotivated, i. e., uncaused choices, is discredited—not by dialectics, but by a demonstration of the method of all conation. In my judgment, it not only points out how wills may be modified, checked, or suppressed, but it "scraps" that ancient and hoary "freedom of the will" which has been called the "freedom of indifference"—free to do anything at all regardless of the ancestry, character, or present situation of the person supposed to be in possession of it. Professor Holt's book is not a manual of practical ethics; but it contributes notably to our knowledge of how to make such a manual. It can not be summarized here, but should be read for itself.

Much is known to-day of those influences which disturb, impair, or destroy altogether the neural mechanism without which there can be no training. This material has never been brought together in any form to make it available for ethical practise. To bring it together in definite fashion would be a valuable service. I refer to what is known of the influence of alcohol, for example, upon the system—*what is known*, not guessed or projected by the perfervid imaginations of prohibitionists; of the effects of various poisons and drugs; of the influence of various foods upon types of organisms; of the destroying effects of fatigue, especially upon those charged with the public safety, such as railroad signalmen, locomotive engineers, chauffeurs, officers of steamships, and the like. We may add also the effects of under-nutrition and of anxiety as well as of over-nutrition and idleness. Then there is a different kind of influence upon which there is not at present much accurately known, which may be indicated, viz., the influence of the economic struggle.

If I have seemed, at times, to cross the line between science and art, it is not to be wondered at; for there is no sharp delimitation to

be made. It would be perfectly proper to consider some of the subjects just mentioned under either.

It is manifest that *the art* of ethics can be practised only when one is sure of his ethics. The relation between ethics as science and, as art has been admirably treated by Dewey and Tufts.¹⁷ The practical aids which I have mentioned or indicated will be equally useful for all ethical systems, for they simply help to carry into effect the various principles; and every one of them has been foreshadowed in the proverbial sayings of mankind, although every proverb has, as it were, an *anti-proverb* which needs to be considered.

VI

In this necessarily brief statement there can be, at best, but a hint of many things. Let me summarize my suggestions for the sake of clarity.

1. Ethics can be and will be treated as a natural science.
2. To insist upon its normative character is to darken counsel and keep it from being studied in any fruitful way. If normative in the absolutist and aprioristic sense, it is impossible to study it as a science at all.
3. The case method, which is in social sciences the analogue of the laboratory method, must be used for the discovery of ethical laws. It is not casuistical, since it does not assume a knowledge of these laws *ab initio*.
4. The *results already attained* by many sciences, notably, biology, anthropology, and sociology, with their subordinate divisions, notably, psychiatry and economics, will be used for the purpose of discovering what man *can do*.
5. The influence of what may be called *social heredity*, through racial, national, and religious traditions, will also be an object of study as well as casuistry properly so called.
6. Since this science is but just conceived, we must remain for a long time on the basis of various traditional or accepted ethical systems. To apply them better and make them more effective, modern knowledge contributes much, notably, an acquaintance with the mechanism of the will through Freud, Holt, and Avenarius.

Such an undertaking as has just been outlined will necessarily meet with neglect or with opposition, criticism of an unfriendly character and misunderstanding. It is, at any rate, an honest attempt to find light in a region where there has been much darkness. It can not hurt any moral imperatives to have them investigated. If they refuse to "show their books" one will indeed suspect them.

At a time such as this, when myriads of men have lost their ethical

¹⁷ Cf. Chapter XVI., § 4, "The Place of General Rules."

moorings in the great tidal wave which has swept over the world, it is wise to examine ourselves and our situation in life; to see if there is anything to which we can hold fast in the wreck of worlds and cultures; to ask whether we have any ideals which can be held in the face of all the facts; and finally, to ask how we shall act so as to make those ideals incorporate. For when one has once found his ideals he is a propagandist; and he must fight with every weapon he can seize or forge to make his ideals prevail.

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REVIEWS AND ABSTRACTS OF LITERATURE

Pragmatism and French Voluntarism. With especial reference to the Notion of Truth in the Development of French Philosophy from Maine de Biran to Professor Bergson. L. SUSAN STEBBING. Cambridge University Press. 1914. Pp. ix+168.

The greater part of this little volume is devoted to a critical comparison of the views of the Bergsonian intuitionists with those of the pragmatists. These two classes of thinkers stand in the forefront of those who "depreciate reason," and Miss Stebbing, writing from a "so-called intellectualistic standpoint," wishes to prove that they are opposed to one another both in their method and in their conclusions, and that "in no sense can the French voluntarists be classed as pragmatists" (p. v). Their divergences can most clearly be discerned in relation to the problem of truth. The pragmatist identifies truth with one of its consequences, while the Bergsonian intuitionist identifies truth with reality. Thus their account of truth is unsatisfactory, because "they both resort to non-intellectual methods of determining truth and of solving metaphysical problems." Miss Stebbing insists that only "by the admission of the non-existential character of truth, and by the complete working out of the demands of intellect, can we obtain knowledge, which is at once complete and rational, hence truly *knowledge*" (p. vi).

The main line of French voluntarism is distinguished by its insistence on personal experience as fundamental and as predominantly active. Miss Stebbing follows this line from Maine de Biran (the real founder of French voluntarism) through Ravaisson and Boutroux, to Bergson and his disciples. A second line is that of neo-criticism. Renouvier, according to Miss Stebbing, is the only French voluntarist who shows any affinity with pragmatism. Thirdly, there is the "*philosophie des idées-forcées*! The pragmatic theory of truth is used throughout as an offset to the various forms of voluntarism.

Miss Stebbing makes her own attitude clear. For her, philosophy is essentially an affair of the intellect, and its aim is to satisfy our "rational nature." Reality may transcend our present powers of logical formulation, but never intellect and logic as such. We need more faith in intellect, not less, and it is the intellectualist's hope "that intellect, in

working out its own perfection, will not fall short of a harmony that shall fully satisfy all our powers of knowing, striving, and loving" (p. 163).

Miss Stebbing's faith in intellect is not conducive to a full understanding of her topic. Throughout she is ultra-analytical, seeking divergences and inconsistencies without having first grasped the spirit and motives of the views she discusses. Her summaries are evidently the result of much thorough research, and salient points are usually correctly stated. But she criticizes theories with which she is so totally unsympathetic that she can not obtain more than a superficial understanding of their meaning.

The concluding chapter deals directly with the relation between intuitionism and the pragmatic theory of truth. It is strange that, but for the barest mention, Miss Stebbing does not refer to the position of Professor Dewey. Many of her criticisms hardly touch his view that truth is the collective name for specific verifications. "Satisfactory" from this standpoint admits of no such vague and various meanings as Miss Stebbing seems to think. Unfortunately, she does not confine herself to her moderate statement of the essence of pragmatism. Intellect is disparaged, she feels, and the ultimate solver of problems is will and its "desire to believe." "The pragmatist, in his extreme anti-intellectualistic ardor, is apt to neglect and scorn the claims of the intellect even to share in the satisfaction that is the mark of truth" (p. 89). The pragmatic criterion of truth is "essentially the outcome of the democratic principle to submit every question to the 'poll of the people' and to cut the knot of every difficulty by the 'counting of heads,' or hearts" (p. 7)!

Miss Stebbing states that her standpoint is diametrically opposed to Bergson's. This is obvious. For purposes of clearness, Bergson often temporarily narrows the meaning of his terms. The clear-cut distinctions that thus arise are taken as final by Miss Stebbing. Hence she accuses Bergson of radical and irreconcilable dualism—except for certain "inconsistent" traces of a monistic tendency. He makes a complete split between the self of everyday life and real personality, between reality distorted for our practical needs and the reality of duration. It seems to her that Bergson banishes freedom and personality much in the same way as Kant, and she actually insists that by freedom Bergson means the "discontinuity of arbitrary choice" and that he upholds the "complete indetermination of reality." The root of her misapprehensions is clear. She does not grasp that, for Bergson, everything is the result of some blending of tendencies. She says that duration is fundamental, but she does not understand that experience has varying degrees of depth and consequent tension of duration.

Miss Stebbing's failure to understand Bergson's view of intuition is not surprising. To any one familiar with Bergson's writings passages will occur in refutation of almost all her statements. For instance, she insists that intuition involves extreme individualism and is essentially incommunicable. Contemplative activity is, for Bergson, incomparably superior to practical activity: the end sought is inexpressible, and the true

philosopher is the silent mystic or, better still, the new-born babe. So little does she understand the interpenetration and mutual working of intellect and intuition that she asserts that there is no criterion to decide between rival intuitions. Bergson's philosophy leads to "vagueness so extreme as to be compatible with any metaphysical theory" (p. 149) or else to a "pessimistic skepticism that may well seem to justify a plunge into pragmatism by way of reaction" (p. 137).

Miss Stebbing rightly points out that Bergson does not anywhere face the question of the nature of truth, and that it is left for LeRoy and Wilbois to develop explicitly what is implicit in Bergson's view of reality. She finds them to be pragmatic when concerned with science, but anti-pragmatic in their identification of truth with living reality. In other words, Bergsonian intuitionism involves a complete divorce of the useful and the true. Is not this to some extent a matter of words? "Truth" is used in quite a different sense by the intuitionists and the pragmatists. But this does not mean that there is no point of contact between Bergson and pragmatism.

It is noticeable that Miss Stebbing does not include in her bibliography Bergson's introduction to the French translation of James's "Pragmatism." There she would have found a discussion of James's view of "Truth and Reality," in which Bergson gives an indication of his own attitude. Bergson's philosophy includes the positive side of pragmatism, while supplementing its agnostic side by endeavoring to prove that consciousness *can* grasp reality. It is better, perhaps, to use the word "true" in the pragmatic sense. Then that which is verified in action in the more superficial realms of experience is true. But from the Bergsonian standpoint this is not all. Such true hypotheses are so, because to some extent they express an intuitive contact with the deeper inmost life of things, that is, with reality.

UNA BERNARD SAIT.

Light from the East: Studies in Japanese Confucianism. ROBERT CORNELL ARMSTRONG. Toronto: University of Toronto. Published by the Librarian. 1914. Pp. xv + 326.

In this book, Dr. Armstrong endeavors to give an outline of the history of Japanese Confucianism. After a brief sketch of the early introduction of Confucianism into Japan, the book is concerned mainly with the Confucian philosophy of the Tokugawa period—the period of 300 years preceding the modern awakening of Japan. The author, who has devoted many years in Japan to the study of the intellectual development of the Japanese, shows the skill in handling the subject, which comes from personal acquaintance with the subject-matter through wide reading of the native literature. He divides the Confucianism of the Tokugawa era into four schools, the Shushi School, the O-Yomei School, the Classical School, and the Eclectic School, and gives a history of each school by expounding its ideas, illustrating the text with many portraits of representative scholars, in chronological order.

As an outline of the history of Japanese Confucianism, the work is quite successful. But the title of the book suggests something more. "The present work," writes the author in the Preface, "is given to the public in the hope that it will throw light on some of the formative elements of Japanese civilization, and lead to a better understanding of Japanese character and life." Viewing the work from this standpoint, the writer is not so successful in attaining his second object as in accomplishing the first. He should have made clearer how the Japanese spirit began from earlier times to assimilate Confucianism, and how, as a consequence of that *process* of *Japanizing* Confucianism during the Tokugawa era, "it was made far more vigorous and efficacious than in China and elsewhere." If Japanese Confucianism can enlighten the West at all, this light does not consist in *what* it contains, but in *how* it came to be what it is. For, as to the content, there is nothing in Japanese Confucianism which is not found in China or in Europe and America; but, as to the process of *Japanization*, it is peculiar to Japan and worthy of investigation. It is really an unfortunate thing that the author of the book conceives that "the light of the East" consists in the matter of Confucianism rather than in that method of development which makes it Japanese. So his conclusion is that "a sympathetic investigation of things Eastern will convince even the most skeptical that 'East is West' and always has been so" (p. 306). "East is West" may be a discovery, but not necessarily the light from the East. In fact, the book is concerned with the former, and not with the latter. "It is my hope," says the author in the preface, "that these studies . . . may lead others to the conviction that East and West are fundamentally one."

Such sweeping statements and criticisms as I made above, can, I think, hardly do full justice to the book, which was written by one who is not a native Japanese. As to the chief attractions of the work, such as a command of language and power of imagery I was, I confess, charmed as I read it.

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JOURNALS AND NEW BOOKS

REVUE DE METAPHYSIQUE ET DE MORALE. November, 1915. *La Philosophie et la Litterature classiques de l'Allemagne et les Doctrines pangermanistes* (pp. 711-793): V. BASCH. - The boasted continuity of German thought since the eighteenth century is vain and Germany is betraying the ideal of her philosophers and showing herself unworthy of the heritage classicism has left her. *Sur la Mémoire affective* (pp. 794-813): L. WEBER. - An attempt to show the fact of genuine affective memory as distinguished from affective states aroused by memories of facts. *La signification historique de la "Géométrie" de Descartes* (pp. 814-827): P. BOUTROUX. - A study of the nature of Descartes's discovery and its bearing upon the type of process found in the history of science. *Études critiques. Les formes élémentaires de la vie religieuse:*

H. HÖFFDING. *Questions pratiques. La Force et le Droit*: TH. RUYSSSEN. *Table de matières. Supplément.*

AMERICAN JOURNAL OF PSYCHOLOGY. January, 1916. *Duration and the Temporal Judgment* (pp. 1-64): JOSEPHINE NASH CURTIS. - The experience of duration as progression is a primary sense attribute, while the judgment of the length of time depends on secondary factors. *On the Psychomotor Mechanisms of Typewriting* (pp. 65-70): FREDERIC LYMAN WELLS. - The experimental conditions increased speed and errors. Many common mistakes are shown. The two subjects were most efficient towards noon. *Some Developmental Psychology in Lower Animals and in Man and its Contribution to Certain Theories of Adult Mental Tests* (pp. 71-86): WALTER B. SWIFT. - The life of a normal human being has four age periods in which certain mental centers are dominant. The "sense period," "period of affection," "period of will," and the "period of intellect" should have exhaustive tabulations of tests that correlate with the respective centers. *Factors which influence the Arousal of the Primary Visual Memory Image* (pp. 87-118): HAROLD E. BURTT. - Complexity of contour, increase in size, increase in exposure, interest, and motor reinforcement facilitate the arousal of visual images. Great individual variations were found. *A Study in Correlation of Normal Complexes by Means of the Association Method* (pp. 119-151): LUCILE DOOLEY. - The associations showed complexes that were common for the different observers. *Bibliography. Book Notes.*

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Moore, Ernest Carroll. *What is Education?* Boston: Ginn and Company. 1915. Pp. vii + 357. \$1.25.

Pearl, Raymond. *Modes of Research in Genetics.* New York: The Macmillan Company. 1915. Pp. vii + 182. \$1.25.

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Worsley, A. *A Synopsis of the Persian Systems of Philosophy.* Reprinted from the Hindustan Review. Pp. 35.

NOTES AND NEWS

THE Section of Anthropology and Psychology of the New York Academy of Sciences met in conjunction with the American Ethnological Society at the American Museum of Natural History on March 27. The following papers were read: "Notes on the Social Organization of Melanesia," Dr. A. A. Goldenweiser; "Tepecano, A Piman Language of Western Mexico," Dr. J. Alden Mason.

DR. W. A. KNIGHT, emeritus professor of moral philosophy in the University of St. Andrews, has died at the age of eighty-one years. Professor Knight was the author of many literary works, including "Studies in Philosophy and Literature," "Essays in Philosophy, Old and New," and "Varia, being Studies on Problems of Philosophy and Ethics."

THE Division of Philosophy, Psychology, and Anthropology, of Columbia University, has arranged a series of conferences for former students of the Division on April 18 and 19 at the University. There will be three sections devoted to philosophy, two to psychology, and two general sessions.

ON the occasion of the initiation ceremonies of the Yale Chapter of the Sigma Xi, Professor J. McKeen Cattell, of Columbia University, gave the address, his subject being "Scientific Research as a Profession."

PROFESSOR RAYMOND DODGE, of Wesleyan University, is giving a series of lectures at Columbia University on "Problems and Methods in Dynamic Psychology."

AT its own request, the department of philosophy at Smith College will hereafter be officially designated the department of philosophy and psychology.

DR. GEORGE SARTON, who is now lecturing in the United States, has been awarded the Prix Binoux by the Paris Academy of Sciences.

PROFESSOR JOSIAH ROYCE, of Harvard University, recently delivered an address in Boston on "The Duties of Americans in the Present War."

DR. NORMAN KEMP SMITH, professor of philosophy in Princeton University, recently sailed for England to join the Allies.

DR. GRACE A. DELAGUNA, of Bryn Mawr College, has been advanced to the grade of associate professor of philosophy.

THE informal meeting of experimental psychologists will be held at Princeton University, April 20-22.

PROFESSOR H. A. RUGER, of Teachers College, has been granted a semester's leave of absence

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

ILLUSIONS OF DIRECTION ORIENTATION¹

THE consciousness of the cardinal points of direction is a subject that has not received the attention which its practical bearings in orientation justify. Mr. Townbridge has pointed out that two fundamental methods of orientation are employed.² The method

¹ This paper was read before a number of my colleagues in the department of philosophy and psychology. In the discussion which resulted it became evident that some of the experiences and difficulties here described are foreign to individuals who were brought up in childhood in cities. These individuals acquired the habit of orienting themselves with respect to certain conspicuous buildings and streets and thought very little of the cardinal points of direction. One reports that the terms east, west, north, and south had a much more particular meaning to him than they did to me. To him as a child the east side of the city (Chicago) was merely the side on which the lake was located; west meant the other side. To such individuals, it appears, the names of the cardinal points have been associated with domi-centric orientation in a purely practical way, and this habit has become so fixed that the persons in adult life on going into a strange city at once establish similar practical associations with very little reference to the sun, or to the cardinal points of direction. Their orientation seems to remain largely domi-centric, to use the term in a wide enough sense to include the sort of practical adjustment just described. My own early experiences were in a country, on a farm, where mountains were constantly visible even to distances of over fifty miles. The practise was to determine the time of day, especially noon, by the position of the sun. The north star early became a familiar friend and guide in the night time. In hunting-trips extensive cross-country excursions were frequently taken both in the daytime and in the evenings when stars were the safest guides as to direction. It is possible, therefore, that the cardinal points of direction have become much more important guides to me in later orientation in cities than to many of my readers. From our discussion it appeared that individual differences of this kind are largely due to early training. If this proves to be the case will it not make even more emphatic the need of attention to orientation in early geography teaching? For more consistency in one's larger geographical conceptions, and for the purpose of preserving a broader intellectual interest in the geographical and astronomical aspects of nature, is it not a good thing to emphasize the ego-centric orientation in the child's early education? Because of these individual differences this paper must be regarded as merely preliminary. It is hoped that opportunities will be afforded for a more extensive study of this subject in the near future.

² "On Fundamental Methods of Orientation and 'Imaginary Maps,'" *Science*, XXXVIII., 1913, pages 888 ff.

generally used by civilized man except in the immediate vicinity of his home is called the *ego-centric* method, because it is based on the intersection at the ego of the lines going out to the cardinal points of direction. The second method Mr. Townbridge calls the *domi-centric*. Orientation by this method is carried on with reference to an established central place, the "home." Birds, mammals, fishes and other animals, young children, and savages are said to employ domi-centric orientation, a method making possible considerable reflex development and the establishment of familiar paths and trails. The successful use of an ego-centric system of orientation implies considerable imagery. It gives only an indirect clue to the direction of the home or starting-place, requiring the individual, therefore, to image the general situation in the form of a map. This map, it should be noted, includes numerous points closely related by direct association. It is evident, therefore, that such a map-construction constantly involves, along with the consciousness of the points of direction, also something of the direct, or domi-centric, orientation. Ego-centric orientation is really, then, a complex of the two systems.

This fact of complexity of the system of orientation employed by adult man seems to lie at the basis of a confusion, as it appears to the writer, in the interesting paper to which reference has been made,—a confusion the clearing up of which will likely simplify the classification of types of errors in "imaginary maps" made by Mr. Townbridge. The confusion seems to be in the failure sufficiently to separate the elements of the domi-centric from those of the ego-centric behavior. Through early faulty instruction as to the direction of certain places, without any reference to the cardinal points, a child may develop a false notion of the direction of a city and yet not be confused as to what is north, south, east, or west. This notion may conceivably have a feeling of reality associated with it even though later experience may have proved it to be false. In such a case the person is not said to be "turned around"; that is, there is no general illusion as to the cardinal points of direction. The purpose of this paper is, however, not to enter critically into the classification of imaginary maps, as given by Mr. Townbridge, but to present further data on illusions of the sense of direction.

If an older child or an adult is asked at any time to indicate which direction is north he will usually be prepared to do so even though his north is not the true north. Many persons have a "feeling" that a certain direction is north when as a matter of fact they know that it is not. They operate on the basis of two ego-centric systems more or less contradictory. We might distinguish in this regard five types of individuals, or better, five types of consciousness of direction, all of which the same individual may experience under different circum-

stances. (1) Those whose consciousness of direction is correct; their north is the true north. (2) Those whose consciousness of direction is wrong and known by experience to be wrong; *e. g.*, what seems to be north may be known to be east. (3) The same as those described in the previous class except that the consciousness of direction is not known (has not yet been found out) to be wrong. This is an earlier stage of the second class. (4) A class early pointed out by Binet and called disorientation—those who are temporarily confused as to what *seems* north. This condition, of short duration, may be experienced on suddenly awaking in a strange hotel, or on a moving train. It may persist for some time if on a cloudy day one is on a train making frequent turns. (5) This type includes the animals, very young children, and probably savages, for whom no general sense of direction has developed. Orientation is domi-centric.

Normally this consciousness of direction has arisen so gradually and by so natural a process in our experiences that we are inclined to feel that it is an innate faculty, just as our moral conceptions were at one time thought to be due to an innate moral sense. It is, however, unquestionably acquired or gradually developed from data furnished by various of the senses, and is, therefore, not a sense at all in the meaning of an original faculty of the mind. It is nevertheless convenient in this paper to use the expression "sense of direction" if it is explicitly understood to be an acquired disposition. Illusions of orientation, or of the sense or consciousness of direction, are cases of disagreement between the person's perception, or general "feeling," of north and the true north.

From the results of observations of various reliable individuals it has been found that there is a tendency for the illusion of orientation to equal approximately 90 or 180 degrees.³ The frequency of the 180-degree illusion has led certain writers to use the term "reverse" illusion of orientation. There are at least two reasons why the illusions tend to approximate one or two right angles. It is possible that illusions of but a few degrees are not as a rule noticed, as they cause very little confusion in behavior, especially when one is going across country where streets and the usual division lines are not visible. The writer has frequently noticed that under such conditions any direction within the limits of a considerable angle could be made to appear north, if attention were centered upon it with that purpose in view. Past experience with streets crossing at right angles, moreover, unconsciously emphasizes to us the cardinal points so that we habitually classify directions according to right-angle units of divergence from the north. Thus we describe objects as being nearly east, south,

³ Binet, A., "Reverse Illusions of Orientation" (tr.), *Psychological Review*, Vol. I., 1894, pages 337-350.

west of south, southeast, always putting the emphasis on the names of the cardinal points. The very adoption of the directions north, east, south, and west as our cardinal points of direction makes it difficult for us to think in other terms, just as the custom of figuring in the decimal system of notation makes thought in any other system difficult. In ordinary thought no other system gets any consideration at all. When first one's attention is called to the possibility of any other plan of notation the thought is somewhat stupefying. Illusions that are noticed are thus unconsciously affected by our tendency to think of directions in terms of the cardinal points. If one has lived in a city the streets of which are laid out according to the cardinal points of direction, one finds in strange cities a strong tendency to see streets following other directions as if they also run north-south and east-west. Finally, illusions of direction ranging from 30 to 60 degrees are by no means wanting.

It is remarkable that in the extensive studies of perception which have been carried out the aspect of the orientation consciousness with which we are here concerned has received so little attention. This is likely because of its fundamental relation to all our spatial perceptions. Psychology has been busy largely with the study of the individual perceptive processes themselves. The various experiences in which each of us is constantly absorbed are given their significance and general setting by associations among themselves. As is true of the heavenly bodies in our firmament, the more remote experiences are likely, by virtue of their more numerous associations, to be the more permanent. Astronomy began with the observation of the more immediate and striking phenomena. In the history of psychology we have gradually been gaining perspective and have thereby more plainly seen the inadequacy of certain earlier views. In the realms of animal behavior, where the complete environment and past history of the individual are more easily observed and controlled, the question of orientation has in many cases received explicit attention, and has been the direct object of experimentation. Even here, however, the facts are relatively complex and as a consequence numerous theories of "distant orientation" have arisen. Hypotheses of a special sense of direction have not been wanting, although no one has attempted fully to show how such a sense might operate. Such an attempt seriously undertaken, even theoretically, would doubtless have had an effect here similar to that in ethics of analyzing the "moral sense" of Shaftesbury and Hutcheson.

There is good reason to believe that a general consistency in one's perceptions of direction is maintained, as is doubtless true of the continuity of self-consciousness, by a multiplicity of factors. This condition makes direct experimental tests difficult. A careful exam-

ination of a few striking cases of illusion of orientation, however, reveal in a measure some of the factors by which the general sense of orientation is maintained. In such an analysis it will be convenient to give the descriptions in a somewhat personal form.

In the summer of 1914 I experienced in Chicago an illusion of unusual vividness. In company with others I was transferring from a north-side to a south-side car. We entered our car as it was facing west just before the turn to go south. When this car started the other members of the party had become seated, but I was still standing giving our transfers to the conductor. The suddenness of the turn which the car made while my attention was diverted to the transfers and to the maintaining of my equilibrium in the standing position "turned me around" completely. When I took my seat the car appeared to be going north. I thought that we had taken a wrong car, but was assured by the other members of the party that we were going south. Of this fact I found further proof on passing certain familiar buildings, and on our arriving at the point where the car line takes a separate course from that of the elevated railway under which we had been moving. Having usually taken the elevated-railway car, I was not very well acquainted with the street along which we were now passing; moreover, as it was dark only a momentary and imperfect view of the familiar marks along the way was possible. The illusion therefore persisted. I saw streets known to lead on the east side to the lake, but which now appeared to go westward. We came finally, on Cottage Grove Avenue, to Washington Park on the right with which I was well acquainted. Not even this enabled me to correct the illusion. Immediately, however, on stepping out of the street-car on 58th Street and Cottage Grove, in the midst of numerous perfectly familiar objects and buildings I felt an "unwinding sensation" in the head, a sort of vertigo, and presto! the illusion was gone. I saw the car start its motion and continue in the direction in which it had been going—but now it was due south.

The sensation of so sudden a "change" is a peculiar one: the various present stimuli, bringing up innumerable familiar associations and attitudes suddenly force some sort of readjustment in one's general orientation attitude. It is a striking bit of evidence that we are not passive in our perceptions and interpretations, but that everything must be seen in some system of generally consistent relations. Coming with such an erroneous sense of direction into familiar surroundings, one experiences for a time a conflict of two different systems. Sometimes the change is gradual; occasionally, when, as in the present case, the conditions are favorable, it is sudden, with possibly even a feeling of being forced by the general surrounding ob-

jects and circumstances. This condition is in some respects similar to changes in personality.⁴

A second case of illusion of direction, which I have been observing for about three months, is more complicated. In certain sections of Minneapolis I am "turned around" to the extent of 90 to 100 degrees. It is not easy to determine the exact extent of the illusion, as any one will find who attempts such measurements. The extent of the illusion also varies for different parts of the city where the illusion is experienced. Though this illusion is readily dispelled when I go into certain parts of the city, or outside the city, it has been impossible for me to get rid of it in the parts of the city with which I first became acquainted. In these sections where the illusion prevails, viz., in part of south and of southeast Minneapolis, the streets are not laid off according to the cardinal points on the compass, but follow the general direction of the river. Having not been accustomed to this condition, though I have, of course, frequently met with it, I find a tendency to perceive the streets as having the more usual north-south and east-west directions. This tendency—which never quite prevails—is especially strong whenever I am in a house looking out of a window which offers a somewhat limited view. My knowledge before seeing the city of the irregularity of the streets, and the fact that my illusion when I came to the city was approximately 90 degrees, likely account for my not seeing the streets as consistently following the cardinal points of the compass.

Having left Omaha for Minneapolis in the night, I found myself "turned around" in the train in the morning. Cloudy and rainy weather made it impossible to right myself by the position of the sun, so the illusion persisted until we arrived in Minneapolis. The sun did not become visible for several days. In the meantime I had become acquainted in a general way with two sections of the city, the part of south Minneapolis between Tenth Street and the river, and Hennepin Avenue and Sixth Avenue South; and the part of southeast Minneapolis between the river and Eighth Street, and Central Avenue and Fourteenth Avenue, including the old campus of the University of Minnesota.

Three factors, then, evidently contribute to this illusion of direction: (1) The relaxation while asleep in a moving train, where bod-

⁴I recently witnessed the restoration by hypnotism of the personal memories of an individual who had completely lost his past experiences. An injury to the head in an accident was the cause of the disturbances. The person did not even know his name and could not recall his vocation or line of work. The change to a "self" with a good memory of numerous experiences of the past—which we found later, however, not to be the true self—and the return back to the "accident self" were immediately followed by peculiar movements and facial expressions of surprise, seeming to suggest an inner feeling of readjustment.

ily attitudes could have little chance of functioning in the maintenance of the sense of orientation even if one were on the alert;⁵ (2) the formation of rather permanent associations of parts of the city with this erroneous direction attitude before it could be corrected by noting the position of the sun; (3) the unusual direction of the streets in the sections of the city with which these associations were formed. I had become so accustomed to streets following the cardinal points of direction that this one condition had become a fruitful means of orientation when the sun was not visible. One does not usually get the concurrence of so many factors favoring the illusion. When the sun did appear it was not a sufficiently forceful check—as was the sight of numerous familiar objects in the Chicago illusion—to correct the false system of associations. Moreover, these associations were in this case already more numerous and permanent than were those in the Chicago case. Of the other members of the family, R, an adult, experienced no, or but very slight, illusions of direction; K, a boy of eleven years, was “turned” about the same number of degrees, and in the same direction, as myself; while two small children, ages five and eight—the latter slightly retarded in development because of sickness early in life—seemed to orient themselves wholly on the domi-centric basis about the new home. Questions asked these two children as to the cardinal points of direction—such as “Which direction is north?” or “Show me which direction is north”—were to them artificial and called out only varying guesses. The methods by which these two children learned the way to certain stores and to school also confirmed the belief that their orientation was domi-centric.

In other parts of the city where the streets follow the usual direction of the cardinal points I experienced no illusion, if my visits to them were made while the sun was visible. This seemed true whether I walked or went in a street-car or in an automobile. Could the illusion, therefore, not be permanently dispelled if I noted carefully my directions along the way on my return? On several occasions I tested this logically plausible supposition. Regularly the illusion disappeared when I got outside of the sections visited on my first (cloudy) days in the city. Usually the disappearance was so gradual that its exact time and place could not be noted. At certain places in the borders of these sections there was much uncertainty experienced as to just what really did seem north! Sometimes on returning I approached by some particularly new way so near the region of the illusion that I fully expected to see it forced

⁵ The importance of a general bodily orientation has been experimentally demonstrated by E. Mach, “On Sensation of Orientation,” *Monist*, 1897, though he does not apply the experiment to direction orientation.

away completely, as was done in the Chicago case just given. At one time, returning from the state fair grounds on the street-car, I had come so near to the area of the illusion with the correct sense of direction preserved that the car had to make but a single turn—a distance of three to six rods. I remember saying to myself: “Now there is a surprise in store for me.” I expected to see the university grounds, which were near at hand, in their true position with respect to direction. But suddenly as the car turned the whole “ground” gained seemed to slip—and the old erroneous view returned. No vertigo was experienced, but there was a decided feeling of discouragement: the situation seemed too big to be controlled without some sort of bird’s-eye view of the surroundings. At this time, and also at the times of the following experiments, I had with me a small pocket compass which I had purchased with the view of correcting the illusion.

An example of the gradual change is interesting. On August 26, 1915, I walked to Seventh Street on Hennepin Avenue. By the time this point was reached my sense of direction was shown by the compass and by the position of the sun to be approximately correct. I began my return from this point at about 2:30 P.M., the exact time not being noted. On the return I walked toward the northeast, and the shadow was consequently cast nearly straight ahead, *i. e.*, in the direction I was walking. Before crossing the river I turned slightly to the right, or slightly more to the east than I had been walking. Some distance beyond the river, at Fifth Street on Central Avenue, the street turns approximately 30 degrees nearer toward the north, or to my left, taking a direction somewhat north of northeast. Each of these turns confused me slightly, so that I could not determine exactly just what did seem to be north. Occasionally I felt that my sense of direction was about right; again, when I tried to think of the relation of the street I was on to southeast Minneapolis, it would seem to be considerably wrong, my north being placed too far toward the east. I expected, however, to make a considerable correction on my illusion as I could approach the “dangerous” section gradually and constantly check up by the position of the sun and by the compass. At Seventh Street on Central Avenue, which I was following, there is a sudden turn of about 90 degrees to the east, to my right, giving me a direction somewhat east of southeast. This was the critical point. If this turn could be made successfully I should be victorious. All that I had gained, or held up to this point, slipped away gradually, however, as I saw the familiar scenes from Fifth to Seventh Streets. At such times one has a peculiar feeling of helplessness. Before reaching the point of this change I could imagine myself at some elevated point seeing the streets lead off from Central Avenue at 90

degree angles, and could consistently image them as following a south-westerly direction. But to proceed I felt was to lose all that had been gained.

Under conditions of such illusions of direction it is incredibly inconvenient to think of the larger divisions of a city and to try to get a consistent view of the whole situation. This is especially noticeable if a stranger asks you for directions to a place in the city outside the area in which you orient yourself in the domi-centric manner. It is the demands of a general social consistency that makes an erroneous attitude or perception so distressing and its correction so urgent. In certain parts of a city one can soon build up a workable domi-centric system for orientation; but when conformity to the activities and conceptions of others is demanded, or when one goes to the map for general directions to more distant points, then trouble arises. While the map is useful in studying the general features of the city, giving relations of one part to another, one finds it necessary to turn it according to one's own direction sense if one is going to some remote part of the city. While the map shows the university to be southeast of my residence, I continue to find it necessary to walk toward the northeast to get it! But suppose that I want to go to some place due east or north of the university, then I am ridiculously confused.

These experiences bring to mind the need of careful attention in the child's geography lessons to the development of the consciousness of direction. I have found that because of the irregularity in the plan of the streets of Minneapolis many of its citizens of long terms of residence have two systems of direction, one that is *known* to be the true one and one that *appears* to be the correct one. This has been found also to be the case in other such cities. Certainly such a condition is sufficiently important to demand the careful attention of public-school teachers. In the arrangement of rooms and of other means for the teaching of geography certain general principles in the development of the sense of direction should be kept in mind. Great aid may also be derived by having certain students carry a small pocket compass which can be had, with the necessary accuracy for practical purposes, for a nominal price.

There are evidently a number of similarities between the development and maintenance of the sense of direction and the development and continuity of personality. Both are dependent upon a multiplicity of factors all of which tend in either case to build up and preserve a practically permanent and comprehensive attitude. The absolute permanency of the self, maintained by the older philosophers, is likely a fiction: the self is gradually changing. Its memories, its likes and dislikes, its acquaintances, its intellectual tastes, its ideals, and its very self-thought are all changing as truly as anything in our

world of living forms. But there is a general continuity throughout these changes. The high degree of constancy of our surrounding physical stimuli, of our own physical appearance, of the names by which we are known, of the attitude of friends toward us, of various social institutions, of spoken and printed language—all these stimuli, and many more, are constantly tending to maintain for us one general attitude, one personality. This personality has, however, many variations, and may by unusual circumstances of disease or accident suffer profound disturbances. If under such circumstances a new personality emerges, it is necessary for the prevention of its permanency to see that the external conditions, social and physical, be made constantly to change as much as possible so as to prevent the establishment of lasting associations.⁶

So we find it also in the case of the changed sense of direction. The first few moments are crucial. Almost any one has likely been momentarily “turned around” in some new place and then has been set right by certain familiar marks, as the sun, the north star, or the sight of some distant mountain. As soon as a person finds that he is “turned around” even to a small extent, it is necessary that he at once take steps to correct the erroneous perception. There are times when this is for the moment impracticable. If at such times the person is on a moving train, or amid surroundings which are constantly changing, there is no need of any anxiety: the associations under such conditions can not become permanent. If, however, the erroneous attitude is seen to persist rather consistently even amid the constantly changing conditions, then it is highly probable that any cessation of these conditions will leave the person “turned around.” Such consistency in the illusion is most likely to develop during a night’s sleep on the train. On leaving the train and going into a strange city it is worth while to bend every effort toward dispelling the illusion. In this undertaking the following suggestions may be of value: If the sun is not visible the true north should be determined as accurately as possible. For this purpose it is a good thing to have, when traveling, a pocket compass. Other means are available, however. If the direction ascertained to be the true north does not appear to be north, the person should avoid as much as possible going out into the city. On going to one’s hotel it would be well to take as little note of general directions as possible, so that erroneous associations will not be too firmly established. Once inside the building, however, where some time is to be spent, it would seem advisable to ascertain the true north and to make every effort so to perceive it. When the sun becomes visible the exploration of the city should begin from some point where the streets follow the cardinal points of the

⁶ See Sidis and Goodhart, “Multiple Personality.”

compass, or from which a general outline of the city can be obtained. The general rule would be to get acquainted with a strange place only when the usual stimuli by which we determine directions in practical life are most obvious and helpful, and to look about as little as possible at other times in case there is a tendency to illusions of direction. Everything depends on the early experiences in a new place, when associations which become basic are being established.

From the foregoing observations it would seem that one is justified in maintaining that in the waking state of consciousness a person is in a condition of tension of adjustment not only with respect to the more or less isolated objects of observation, but also with respect to their interrelations on a very extensive scale; that experiences are not each of a somewhat momentary and isolated character, but that they overlap in such a way as to call out comprehensive motor attitudes so that the effect of each stimulus is carried over in a cumulative manner not to be explained in terms of single neural pathways; that this cumulative motor attitude constantly comes into conflict with other such attitudes, bringing about certain confusions in orientation which may persist through life if their opposition is not reduced in the early stages of the association processes; and that these attitudes are kept up by the constantly recurring conditions of stimulation afforded by certain unchanging or slowly changing aspects of the physical and social environment. These motor attitudes⁷ doubtless relax during sleep, but are again resumed on waking because of numerous direct and indirect stimulations similar to those of the previous waking state.

The writer has suggested in another article now in press,⁸ that on the basis of this overlapping of the effects of individual stimuli we may explain the survival of the pleasant or successful acts in the process of learning over those that do not bring pleasure or success. Acts are not individual or discrete things, some of which survive as such while others are wholly eliminated. It is difficult to understand how the pleasurable "act" survives while the others are dropped off, unless one is willing to subscribe to the view that pleasure of itself

⁷ Recently a number of psychologists have given more or less explicit attention to "attitudes," but usually of a more limited kind than those here studied. There is yet no general agreement as to whether such attitudes are ultimately analyzable into sensory elements or whether they are at times wholly motor and "imageless." Some writers have called them "conscious attitudes," while others, regarding them doubtless also as conscious, have used the term "motor attitudes." All writers seem to be at an agreement in regarding attitudes as being characterized by tendencies to response, whether as in "perceptual responses" or as in more overt activity. Of late it has been made plain that many acquired dispositions to certain types of responses are wholly unconscious.

⁸ To appear in the *Psychological Review*.

"stamps in" the act which produces it. The difficulty lies in not understanding how an act can be emphasized by a successful result which follows it and which must, therefore, have a backward influence upon it. If responses overlap, forming larger unities, is it, then, not conceivable that no "act" is complete, in the higher organisms at least, until all responses of its own complex—*e. g.*, those directed toward getting out of a problem box—find expression together? May there not be mutual inhibition and delayed response until some consistent outlet involving mutual reinforcement is found by the trial and error processes? It is hoped that this hypothesis will tend to put the explanation of learning on a more objective and experimental basis than the conventional one of mere neural processes, often vaguely conceived or wholly hypothetical.

JOSEPH PETERSON.

UNIVERSITY OF MINNESOTA.

THEORY AS TRUTH: A STUDY OF THE LOGICAL STATUS OF SCIENTIFIC THEORY¹

"Although in this long journey we miss the intended end; yet are there many things of truth disclosed by the way; and the collateral verity may unto reasonable speculations some what require the capital indiscovery."²

THE greatest feats of science to-day—for science is the acquisition and communication of knowledge—are, I suppose, not its facts, much less its deeds, but in very truth its theories. The theories of modern science deal commonly with things that we can never hope to reach with our senses, with matters that are beyond the reach of immediate experience. To questions which have been under discussion through the ages, questions such as those of the atomic constitution of matter and the nature of light, science to-day in its theories gives perfectly definite answers. The nature of the case forbids that these questions shall be answered by facts. When the theories which answer them, however, are submitted to the scrutiny of logic, it appears that they are not hypotheses in any sense and that they have a certainty of the same order as that of *any bit of experience*. It is as certain that matter consists of atoms as it is certain that experiments can be performed in the laboratory—and the opinion that matter is made up of atoms is no guess: we may be as sure of it as we are sure that there is matter at all.

¹ The notions here developed were first worked out for Professor Royce's seminary, 1914-15.

² Sir Thomas Browne, "*Pseudodoxia Epidemica*," Book VI., Ch. 12.

Unfortunately, the scientists themselves use the word, *theory*, loosely and without any exact conception of its application. One says: "A theory makes it possible to understand and remember an extraordinary number of facts with little effort. A theory is a short way of describing a group of phenomena."³ "A theory," says another, "is a supposition we hope to be true; an hypothesis is a supposition which we expect to be useful."⁴ Still another believes a theory to be an especially plausible kind of interpretation.⁵ It seems unnecessary to multiply instances. The loose use of the word is evident.

Law has been defined for science, and the inductive method has been studied very thoroughly by logicians, notably by Charles Peirce. The use of hypothesis as a stimulator of research and a maker of *law* has been described; and hypothesis has been exalted to the highest by pragmatism. Theories, so far as I know, have not been defined. The need of a definition is all the more crying inasmuch as there are some "theories" in science which are neither laws nor hypotheses. Some of the so-called "theories" are actually hypotheses, some of the so-called "hypotheses" belong to this third class of knowledge and, although *workable*, they possess a certainty wholly beyond that inherent in their workableness. Hypothesis is *possibly* true, law is *probably* true, and *theory* is as true as a fact. "What?" said Dr. Johnson, in talking about the metaphysics of Berkeley, "to tell me that *that*," here he kicked the table-leg, "doesn't exist"? Whatever may be the merits of the arguments for the existence of *that*, if you grant that it exists at all, then you grant at the same time that it consists of atoms—or, if we only dream *that*, then, in a world where there are such dreams, there is only one correct way to dream—which is that *that* consists of separable particles.

In this paper, therefore, I shall attempt to point out that there exists, among the mass of knowledge which constitutes science, a certain class of opinions which are logically different from laws and hypotheses. Many of them are already called "theories." For all members of the class I propose the name *theory*. I shall show that theories possess a special kind of certainty. They are the surest thing that science knows.

I. INSTANCES OF THEORY AND OF ITS SCOPE

In 1849 Fizeau⁶ performed an experiment in which a beam of light was made to pass between the teeth of a toothed wheel to a dis-

³ Daniel Comstock.

⁴ G. J. Stoney.

⁵ Theodore Richards.

⁶ Fizeau's experiment was not the first consideration to indicate the space-time quality of light. I have selected it because it seems clear and suitable for the present purpose.

tant mirror from which it was reflected back again over the same path to the eye of an observer. As the wheel was rotated, a beam of intermittent light passed through to the eye. When the speed of the wheel was increased, a point was reached at which the light was totally eclipsed and none passed through to the eye. That is, during the time required for the light to pass between the teeth to the mirror and back again to the place through which it came, during that time the wheel had moved so that the point in space occupied by the opening between the teeth was now occupied by the tooth itself, and no light could get through. At twice the speed of rotation required for this first eclipse the light again passed through to the eye. The light passed through one notch in the periphery of the wheel to the mirror, whence it was reflected back to the wheel, now to pass through the notch next the one through which it came. At three times the original speed the second eclipse occurred, and so on.

Although in describing this experiment I have been forced to speak of the time required for light to travel from one place to another, it is still evident that the experiment might be observed without any foreknowledge (or after-knowledge, for that matter) of the velocity of light. All that is seen is an arrangement of mirrors and lenses, a rotating toothed-wheel, and sometimes light through the eye-piece, sometimes not, according to the rate of rotation of the wheel. But, *unless light is something which has a velocity*, these things could not be observed. That is the theory. It is *true*, as the older physics books used to say, that light is a "mode of motion."

Theories, when discovered, usually have the effect of destroying some hypothesis which was held earlier. Descartes guessed that light was "the effect of a pressure instantaneously transmitted through a universal medium."⁸ The fact that light has a velocity means that light can not be the effect of a static pressure. When it became clear that light was a mode of motion, two rival hypotheses sprang up—the emission or "corpuscular" hypothesis of Newton and the undulatory hypothesis of Huyghens. Both have always been called "theories," but both were pure guesses, made because they offered what seemed to be plausible explanations of certain phenomena. There was a little

⁷ Unfortunately theories are usually expressed as universal statements. The real theory, which is true, is that light (*the particular light which was used in the experiment*) has a velocity. The statement that light (*all light*) has a velocity is something else—law or convenient definition, I do not know—and, of course, the statements here made about the truth in theories do not apply to that universal statement. In the following discussion I shall express certain theories in the form of universal statements, for such is the habit of science. But real theories are, in strict logic, particular statements—as particular as the experiment.

⁸ Duff, "A Text-book of Physics," page 360.

truth: these, in addition, supplied gratuitous opinion. I know no better name for them than the one used by William James in discussing religious experience. They were "over-beliefs."

The hypotheses of Newton and of Huyghens seemed to explain about equally well the phenomena of reflection and of refraction. The discovery of interference eliminated one of them. Some thinkers in the methodology of science have called the experiment of Thomas Young on interference a "crucial experiment"—because it decided between two rival hypotheses. It is that, but it seems to me that there is something about it far more important. *Even if there had been no Newton and no Huyghens, the experiment of Young, properly interpreted, would have led to a certain theory, a certain truth—the undulatory theory of light.*

In Young's experiment, light from a single source is made to pass through "two narrow slits, very close together, which act as secondary sources. If a screen be placed beyond these slits a series of colored and dark bands parallel to the slits will be observed on it. If one of the slits is covered, the bands disappear. This shows that they are the resultant effect of two superimposed pencils of light alternately reenforcing and destructively interfering with each other."⁹ Unless light is a wave motion, there could be no reenforcement and interference, and the screen, placed beyond the slits, would be evenly illuminated in all its parts. Given this observation, it becomes certain that light is a wave motion. That is the theory.

It is to be noticed that a specific fact, or law, or set of laws, renders certain such and such a truth—but there is still room for over-beliefs. Another law is discovered which renders certain a little more of the truth and does away with part of the over-belief. When enough laws have been accumulated the situation becomes closed—within this small area we have truth—within these limits there is nothing more to be said. Light is a mode of motion—the area is mapped out. Light is a wave motion—there is no more truth obtainable within this area. The result of this is that the theory is necessarily broad in its phraseology. It does not go into details. That which does go into details and which may be expressed exactly is the law—which is probable.

Boyle's law states that, the temperature being constant, the volume of a gas varies inversely as the pressure. Charles's law states that, volume being constant, the pressure of a confined volume of gas varies directly as the absolute temperature, or, that, pressure being constant, the volume varies directly as the absolute temperature. The two laws may be combined, thus: $PV = KT$. It is probable that the pressure-volume product for a confined quantity of any gas is directly

⁹ Duff, *loc. cit.*, page 364.

proportional to the absolute temperature. *Unless* gases are alike in their inward constitution this could not be. It is true then that gases are *mechanically* alike. That is the beginning of a gas theory.

Gay-Lussac's law says that gases combine chemically with one another volume for volume or in proportions by volume which are expressible as the ratios between small whole numbers. Thus, one volume of hydrogen combines with one volume of chlorine to form hydrochloric acid, one of oxygen combines with two of hydrogen to form water. There is also the law that elements combine with one another in definite ratios by weight. On the strength of this second law a *chemical unit* (an atom) may be defined as that quantity by weight of a given element which will combine with a unit of some standard element—with a unit of hydrogen. Now, from the first law, which is probably true, it is possible to get a theory which is definitely true: for, *unless* equal volumes of gases contain numbers of chemical units which are relative to one another as the ratio between small whole numbers, gases could not combine in simple ratios by volume. Combine this now with the rudimentary gas-theory of the preceding paragraph and a very important theory results—the beginning of the kinetic theory of gases. Equal volumes of gases, under the same conditions of temperature and pressure, contain an equal number of *physical units*—the mechanical, pressure-volume things (molecules), and, if the gases are elementary, the molecules contain each a simple whole number of chemical units or atoms. This has been called “Avogadro's Hypothesis” after the man who first enunciated it. It is of the utmost importance to physical chemistry. But it is not an hypothesis, it is not a guess; it is a theory—and true.

With this bit of theory available, we are in a position where it is relatively easy to learn more new truth. The question might arise: How many atoms does the hydrogen molecule contain?—or, in another form: Is the chemical unit of hydrogen identical with the physical unit? One volume of hydrogen combines with one volume of chlorine to form two volumes of hydrochloric acid gas. Then the physical unit of hydrochloric acid contains two chemical units, one of hydrogen and one of chlorine. Let n equal the number of physical units contained in a volume of gas under the conditions of the experiment. Then we have that n physical units of hydrogen combine with n physical units of chlorine to form $2n$ physical units of hydrochloric acid. But the $2n$ molecules of hydrochloric acid contain $4n$ atoms. Then the n molecules of hydrogen plus the n molecules of chlorine must have contained $4n$ atoms. Moreover, the number of hydrogen atoms and of chlorine atoms was equal. Therefore, the hydrogen molecule and the chlorine molecule each contains two atoms. *Unless* each contains two atoms, one volume of one could not combine

with one volume of the other to form *two* volumes of a gas whose molecule, from the fact that it is a compound, is known to contain two atoms.

This bit of information, that the hydrogen molecule contains two atoms, is logically of the nature of a theory. So far as I know it has not been called either a law, or a theory, or an hypothesis. It seems less important and less universally interesting than the truth that light is a wave motion. Still it deserves to be pointed out that science is full of these little bits of knowledge which are not merely probable (as far more important laws, like the law of gravitation, are probable), but are true.

In a world where one kind of matter combines with another kind of matter in a definite proportion by weight, where gases interact chemically in simple ratios by volume, where the law that the pressure-volume product for a given quantity of gas is proportional to the absolute temperature is a genuine law, there are chemical units and physical units, or *atoms* and *molecules*, and equal volumes of gases contain an equal number of molecules. And the molecules are themselves made up of a perfectly definite and determinable number of atoms—where the atoms are still taken as chemical units in the same manner that the gram is a unit of mass. But in this world the question can not be answered whether or not atoms and molecules are truly particles—discrete and separable.

The fact that a piece of sugar dissolves in water proves nothing as to the inner constitution of the sugar. It is conceivable that the water merely increases the distribution of the sugar—that it is a medium through which the sugar attenuates itself. Sugar might well dissolve in water without either of them—for all we know—being made up of ultimate particles. The fact that a given quantity of water will hold in solution in stable equilibrium only so much sugar and no more—taken by itself—proves nothing. Iron and sulphur combine in definite proportions when heated together to form a new substance whose properties are different from those of iron or of sulphur, and whose properties are not, in any sense, intermediate between, or a blend of, the properties of the elements from which it is made. But it is not unreasonable to suppose that the iron dissolves the sulphur—that they distribute themselves one through the other—and there seems no reason, *a priori*, why the resulting solution could not have properties wholly different from those of the substances from which it is made. The law that elements combine does not require the theory of the atomic particle. Neither does the law of definite combining weights—for there seems no contradiction in supposing that a given quantity of a solvent will dissolve just so much, no more and no less, of another given substance:

if too much of the substance is taken there will be some left over, undissolved; if too much of the solvent, then there will be some of the solvent that is doing the actual dissolving and some that is left over, inactive. The law of multiple proportions, likewise, does not lead to the theory of individual atoms.

Chemists have long held to the notion that matter is composed of individual particles. For a long time the notion was an hypothesis—an hypothesis suggested by facts such as those just mentioned—but not required by them. It made possible clear mental pictures and neat descriptions of phenomena. It had the value of its pragmatic workings, but it did not possess the truth which attaches to a theory.

It does not matter whether the milkman adds the water to the milk or adds the milk to the water; the result in either case is the same. And in making a pudding the order in which the various ingredients are added is immaterial; if the same quantity of each ingredient is used each time, the same pudding will always result. Thus, if matter does not consist of particles, the order in which several elements combine to form a complex compound does not matter, and whenever the same quantities of the same elements combine the same compound will certainly result.

On the contrary, if compounds are built up of particles of the constituent elements, in a manner similar to that in which children build towers and houses from wooden blocks, then the arrangement of the particles is an important matter: and, just as different arrangements of the same blocks will give different sorts of houses or towers, so different arrangements of the same atoms will give different compounds. That is, it is impossible that there should be more than one compound of a given molecular weight and empirical constitution, more than one compound whose physical unit (or molecule) contains definite numbers of specific kinds of chemical units (or atoms) *unless* matter consists of particles. If two *different* compounds are known of the same molecular weight and constitution, then there is the corresponding theory—which is as true as the fact that the two compounds exist—that a compound is built up of particles and that the molecule itself is a particle made up of particles.

In 1823 Liebig demonstrated that silver fulminate and silver cyanate have the same molecular weight and empirical constitution. Such substances are said to be *isomers*, or *isomeric* with one another. Silver fulminate is a white crystalline solid, soluble in water, and exceedingly explosive. Silver cyanate is white, not soluble in water, not explosive, and is decomposed by strong acids. The discovery

that this harmless substance possesses the same composition as explosive silver fulminate created a great impression. In 1828 Wöhler changed ammonium cyanate into urea—and proved incidentally that the two substances are isomeric. Ammonium cyanate had been prepared before only from inorganic sources and urea only from organic ones. Ammonium cyanate is decomposed by alkalis to give the alkali isocyanate and one equivalent of ammonia. Urea is decomposed by acids and by alkalis to give two equivalents of ammonia and one of carbon dioxide. Wöhler's preparation of a typical organic substance from an inorganic one served to break down the artificial barrier between organic and inorganic chemistry. But, with the discovery of isomeric substances, the notion of the atomic particle ceased to be merely an hypothesis and became a theory—it entered into the state where it could be seen by reflection to be true. *Unless* matter consists of particles, there can be no isomeric substances.

II. INDUCTION GIVES US WARRANT TO THEORIZE

With these instances of theory before the mind, it will be well to consider briefly the nature of law and of hypothesis. This will not only make the situation clearer by showing us opinions in science which are not theories; but, more important, it will show us by what right theories can claim to be true.

When I have seen a swan and seen that it is white, when I have seen no swans that are not white, when I see more white swans, then I make for myself the generalization, "All swans are white." This is the inductive method. The opinion that all swans are white is a law. It is *probably* true. It is *true* that it is probable that all swans are white. Mr. Charles Peirce has shown that *true* here possesses the same meaning as it does when we say, "It is true that a given thing can not be both *A* and not — *A*." That is, the probability is not merely one that satisfies our mind; it is a genuine probability—provided always that the swans, upon the observation of which I base my generalization, constitute a fair sample of all the swans. Thus, a law in science, like the law that an alloy of two metals has a lower melting-point than either of the metals taken singly, is as genuinely probable as the theorems of the algebra of logic are genuinely true.¹⁰

The scientist makes first an observation, and, as the result of it, an hypothesis comes into his mind—"Perhaps all the things of this sort are the same"—then he goes about to make more observations

¹⁰ A discussion of Mr. Charles Peirce's contribution to the logic of induction may be found in Professor Royce's article in the "Encyclopedia of the Philosophical Sciences," Vol. I., pages 82 *et seq.*

to verify his hypothesis; finally, when he has found a number of instances in accord with his hypothesis and none in disagreement with it, his hypothesis becomes a law. That which was at first a pure guess is now probably true. Hypotheses are used in science mainly as a means of getting at laws, but they are not all so used. There are hypotheses that are nothing but fanciful guesses: their only excuse for being is that they give anchorage to ideas—and, alas, many of them go at present by the name of theories.

Professor Royce has pointed out that a *fair sample* is an instance which is not antecedently likely to be in conformity with the hypothesis which is being tested.¹¹ Mr. Bertrand Russell holds that the simple enumeration of instances—from whatever source, and without any consideration of the antecedent likelihood of their conformity—is sufficient to establish an inductive generalization.¹² He says: "The greater the number of cases in which a thing of the sort *A* has been found associated with a thing of the sort *B*, the more probable it is (if no cases of failure of association are known) that *A* is always associated with *B*. . . . For example, a man who has seen a great many white swans might argue, by our principle, that on the data it was *probable* that all swans were white." "Suppose," he was asked, "that a man has a pair of white swans, and that he has never seen any other swans, and that he uses this pair for breeding; suppose that, as his flock increases, he observes that each of his swans is white; is he correct in generalizing that all swans are probably white?" "Yes, he is," said Mr. Russell. This seems absurd, and I am sure that no scientist who has worked much in the field or in the laboratory would think of making such a generalization. He might say: "It seems probable that color, with swans, is an hereditary characteristic," but surely he would not say, "It is probable that *all* swans are white." Such cases as that tend to persuade one away from the views of Mr. Russell, but there remains still an *argument* against his opinions.

In arguing for the mere enumeration of conforming instances as against the enumeration of instances which do conform, but of which

¹¹ There is another way of deriving laws—by the discussion of the standardized experiment, but it seems to me that the experiment is itself *probably* a fair sample of all possibly suitable experiments. The experiment is itself a law. Also I believe that the so-called "facts" of experience are not what they seem to be. They also are the outcome of earlier inductions. The only real facts are the infrangible fragments of data which epistemology starts with. Fortunately, to the little inductions which are epistemologically earliest there correspond primitive theories. I hope to develop this matter in another paper.

¹² Russell, "The Problems of Philosophy," Chapter VI., pages 104-05.

none are antecedently likely to conform, he has said, in effect, "You suppose it probable that a certain instance is likely to be in conformity with your hypothesis. Well, this probability itself is the result of the simple enumeration of instances." "But," one might insist, "not at all, this probability has itself been established by an examination of instances which were not antecedently likely to conform." "Very well," Professor Russell may say, "carry your regress back as far as you like, carry it back even to the beginnings of experience where sense-data are accepted in all naïveté, you come at last to a position where you have no longer means of forming judgments about antecedent likelihood—you are *forced* to rely on the enumerations of instances." Now, I answer, in order that instances may be enumerated for purposes of induction it is necessary that they be in the same class—they must be identical in *this one respect*. On the borderland of epistemology, experiences are supposed which are atomic in their simplicity—they have only one property—they have only one mark by which they may be known. Given two such experiences, they either are identical or they are not. If they are identical, they will not serve as instances to illustrate a more general law—they are useless for purposes of enumeration. If they are not identical, then they are not antecedently likely to conform to any namable law. Clearly, induction depends upon the enumeration of instances, but of instances whose conformity is not to be foreseen.

Professor Russell says also "a sufficient number of cases of the association of *A* with *B* will make it nearly certain that *A* is always associated with *B*, and will make this general law approach certainty without limit."¹³ Evidently he means that as the number of observed instances increases so the feeling of probability grows and grows until at last it amounts to a practical satisfying certainty. That is psychology, not logic. The interesting thing about certainty in induction is that the law, reached by an examination of *fair samples*, is *certainly* a genuine statement of what is probably true. For, "if we choose partial collections from a larger collection, and judge of the constitution of the whole collection from that of the parts chosen, fixing our attention upon definable characters present or absent, in the partial collections, we are aided toward probable inferences by the fact that there are *more* possible 'samples,' or partial collections, that at least approximately agree in their constitution with the constitution of the whole, than there are samples that widely disagree."¹⁴ It is not merely probable that all *A*'s are *B*'s,

¹³ Russell, *loc. cit.*, page 104.

¹⁴ Boyce (discussing Peirce), *loc. cit.*, page 86.

where the *probable* is a psychological thing open to discussion; if the law is properly made, *it is true that it is probable*.¹⁵

III. THEORY AS TRUE AS FACT

A theory in science is a statement of the conditions without which a certain law, or set of laws, could not be even possibly true. Whatever may be the meaning of "probable," surely it is something better than "possible." Suppose, for the sake of exactness, that the law states that, relative to a certain group of phenomena, the group itself being exactly defined on empirical grounds, *A* is probably the truth. We may then make a proposition, ϕ_1 : *A* is possible, and another, ϕ_2 : *A* is impossible. The difference between them, $\phi_1 - \phi_2 = \text{Conditiones sine qua non}$. Let us call these conditions the "Body of Opinion, *T*." On purely deductive grounds one may say: "Unless such and such were the case *A* would not be possible; there are these *conditions without which A could not be*." In science the body of opinion, *T*, embodying these conditions is frequently sought after with eagerness, and, when found, it often comes to be known by the name of a theory. I assert that such bodies of opinion exist among the materials of science. They are often called *theories*, but not always. Nor do all so-called *theories* comply with the conditions here defined—many of them are actually pure guesses. It seems certain that the things which science makes, the end result of all its work, are of three kinds—*laws, pure guesses, and the sort of bodies of opinion here defined*. I propose to call the pure guesses "hypotheses," and the sort of things like the body of opinion, *T*, by the name of "theories."

If the law is true, if it is certainly true that *A* is probable, it seems to me to be equally certainly and genuinely true that the facts embodied in *T* are true also. The truth of the theory follows from the genuineness of the law.

In order that there may be a law, there must be at least one event in accord with it, and wherever there is a single event, even though that event gives rise to no law, there is still the set of conditions without which that event could not be. Single events, experiments, observations, as well as laws, give rise to theories. And if a philosopher is so skeptical as to insist that it is only probable that the observed event exists, so long as he admits that it is a genuine probability, then the facts embodied in the corresponding theory are

¹⁵ The probabilities of the insurance underwriter are not genuine probabilities—they are only probably probable. They are derived from the examination of what are *probably* "fair samples." So it is in general with statistical probability. Fortunately, experimental science deals very little with statistical probabilities. A further analysis of statistical probability is needed.

still true. The man of science, I suppose, will not be disposed to question the existence of the event observed in his laboratory; and, for my own part, it seems to me that the presuppositions which common sense makes in regard to the material world are legitimate theories resulting from simple laws which now lie hidden, for the most part, beneath the flux of our unreflecting complex experience. But that by way of suggestion; it is another story and must be developed at another time.

The science of chemistry is peculiarly rich in theories. Tautomerism and labile bonds, stereochemistry, thermochemistry, and the relative stability of allotropic modifications, will show, I suspect, some interesting things when subjected to a logical study. It needs to be known whether the kinetic "theory" of gases and the ionization theory are true theories or plausible hypotheses. The recent work of the Bragges and of Irving Langmuir will probably lead to important theories concerning atoms and the structure of molecules. For the present paper it is enough if I have shown that the chemists' atomic theory (although in the early days of the science it was an hypothesis or overbelief) possesses, in the main, the same sort of truth as any bit of experience. Surely its certainty to-day is beyond the starry dreams of Democritus and Epicurus.

The theories of physics seem to be fewer and less vast than those of chemistry. Perhaps this is because, while chemistry is built upon a theory, the foundations of physics are the presuppositions of common-sense activity. Whether the other sciences contain many theories is important matter for research. It would be interesting to learn how much certain truth there is in the "glacial theory," the "theory" of organic evolution, the nebular "hypothesis," or the hypothesis that "the moon came out of the Pacific Ocean."

Finally, it deserves to be noticed that the theorizing tendency, the tendency to seek deductively the conditions without which a certain phenomenon, or group of phenomena, could not be, is one which has characterized the great advances in scientific knowledge. The advent of a new theory has been the index of the advent of genius. Genius the most genuine has been needed to produce real theories. If, in the foregoing, I have chosen poor instances of theory, it is ascribable to ordinary frailty; but the logic remains—and the fact that the great men of science can, and do, tease out of phenomena this illuminating collateral verity.

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REVIEWS AND ABSTRACTS OF LITERATURE

Sādhana: The Realization of Life. RABINDRANATH TAGORE. New York: The Macmillan Company. 1913. Pp. 164.

Mr. Rabindranath Tagore, recipient of the Nobel prize for poetry, enjoys a popularity perhaps exceeding that of every other living native exponent of Asiatic thought to the West. The present book, which has now been published for some time, is his first in English prose unless we regard as such the unmetrical translations of his verse. As an interpretation of far Eastern ideas in terms palatable to the Westerner, and also for soft persuasiveness of style, it compares with the writings of Fielding Hall and Margaret Noble. For charm of thought, imagery, and words, it may be accepted as above criticism. Mr. Tagore was born and reared in an environment of Hinduism, he is a teacher in schools of his country, he has discerned it deeply, and he brings up from it much that is un-localized and inspiring.

In developing his subject he considers first the relation of the individual to the universe, showing how the Indian feels his oneness with nature, but especially with the divine soul therein. This, further, is to be realized through consciousness of one's own spirit and of its powers for blessed fruition. Evil is disposed of as a condition necessary to the working out of good. Selfhood is emphasized with the strong Brahman sense of personality which, however, finds its true meaning not in separation, but in union with the All. Life may be realized through love, beauty, and action. The key to the universe is joy, which expresses itself through law, but transcends law, and for which love is another name. Realization through action, through the joy of work, is Western in spirit, and Mr. Tagore censures some of his countrymen for undue dreaminess, though he appeals for support to the Upanishads. One is reminded of Aristotle's saying that "pleasure perfects the act of working, and so life, after which men grasp," but Tagore carries the idea into ethereal regions unknown to the peripatetics. The final chapter, on realization of the infinite, suggests a class of literature not unfamiliar in occidental book-stalls.

Obviously this teaching is orthodox Brahman in substance, but Mr. Tagore has imported into it a poet's fervor, a modern man's rationalism, and an optimism distinctive of sunset lands.

As a religious eclectic, affiliated, it is understood, with the Bramho Samaj, he refers to Jesus and to Buddha sympathetically. The latter he frequently quotes as teaching doctrines in agreement with his Brahmanism and he tries to interpret away the Buddhist negations. If he has strained even Hinduism to accommodate his expansive optimism, he has burst the Dhamma asunder. True, he cites a discourse of Buddha with Sādhū Simba (Sīho of Vesāli, mentioned in the Vinaya) which, if it stood alone, would go far toward justifying him, but this passage is so exceptional in Buddhist apologetics that if it were reliable it would render much of the canon meaningless. Again, in writing of infinite love, Mr. Tagore says: "Buddha names it Brahma-vihāra, the joy of living in Brahma." This is

very misleading, since Buddha had no use for any Brahma in so mystical a sense.

An ambassador of the East to the West, we must look upon Mr. Tagore's office as mediatorial, and mediation implies compromise. In one sense this is just the work needed, a blending of extremes, a participation of benefits. But is Mr. Tagore free from that compromise which is to win favor by surrendering principles needed by us occidentals as a bitter corrective? Is not rather his popularity in America due to his expressing for us our pet enthusiasms in the swart paynims' romantic forms? If there is one quality paramount which India has proclaimed and of which the Western world to-day stands in dire want, it is *pity*. To this Gotama Buddha gave the clearest voice, but his feeling was not alien from that of his countrymen. To realize not merely life, but what life means to multitudes who suffer intensely, this the West hates as pessimism, and in glorifying the optimism which its own lot facilitates, it has blinded the eyes of its sympathy. *Ex oriente lux* we cry, and we welcome it so long as it is the light that dazzles rather than that which would enable us to see the hard facts of human and animal existence. Mr. Tagore is doubtless a tender-hearted man—his books prove it—but the lessons of his vivacious enthusiasms, not to mention the occasional voluptuous fervors of his poems, are far different from the chastened compassion that India might teach us. His complacent view of pain, with its disciplinary value, is unfeeling, like that of John Fiske, for example. Perhaps it is true that all suffering may be justified by its relation to the general plan, but in any aspect that concerns us practically a large part of the misery in the world is wholly without benefit. Let us gladly accept his chapter on fellowship with nature, but in a lowlier sense than his. Ours is no time for an apotheosis, but for a kenosis.

However, it is not assumed that many Americans will concur with this dissenting opinion, which in one way is a compliment to Mr. Tagore, since it holds him to account for the use he is making of a great influence.

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Business Psychology. HUGO MÜNSTERBERG. Chicago: La Salle Extension University. Pp. 296.

This latest volume by Dr. Münsterberg is intended to furnish the man in business and industry a genuine scientific basis for dealing with the many problems involving the human mind with which he has to deal. Although the author states that the reader who expects to find light, snappy, gingery, and withal superficial treatment, will be disappointed, the fact remains that the book is written in language and style that make it readable by the ordinary layman, and at the same time lay a solid foundation. The first three chapters deal respectively with "Business and Psychology," "Scope and Methods of Psychology," and "The Application of Psychology." In these preliminary chapters the author demonstrates that there is a definite science of the human mind as solid, as scholarly, and as systematically worked out into principles and laws and methods as

the sciences of physics and chemistry. He emphasizes the fact that man is more important than machinery, thoughts more valuable than equipment, and personality the biggest factor in industry and business. He shows how the educator, the doctor, the lawyer, and the artist are applying the laws of psychology, and bespeaks a similar application to the wider fields of economic endeavors.

Chapters IV. to XI. deal with "Mind and Body," "Sensation," "Perceptions," "Memory and Ideas," "Attention," "Feeling and Emotion," "Impulse and Will," and "Suggestion." These chapters are stripped of all technical nomenclature except where technical terms are unavoidable and a knowledge of them is necessary. They are rich in practical examples. For instance, in explaining what a percept is he says: "We perceive a page in Japanese print exactly as well as the Japanese perceives it. The fact that he connects with every sign an idea which gives meaning to it lies outside of the process of perceptions."

Chapters XII. to XVIII. deal with application of principles, being entitled, respectively, "The Acquirement of Abilities," "The Outer Conditions of Efficiency," "The Inner Conditions of Efficiency," "Vocational Fitness," "Individual Mental Traits," "Selection of Fit Individuals," and "Mental Tests."

No attempt is made to use and define such terms as "Pre-perception" or "Apperception" and similar expressions which have made psychology a bugbear and a nightmare to school teachers. It takes a man like Münsterberg, who is an acknowledged master of the higher technology of his subject, to write in such a style. The author shows an understanding of the business man's and manufacturer's problems and an appreciation of the work and field of the engineer which the writer has not as yet found in any other work of the sort. Moreover, the reader gets no sham, but real psychology with a characteristic German thoroughness. Dr. Münsterberg has done a public service in writing such a book.

The publication of such a practical and thoroughly scientific text is indicative of the progressive spirit of the modern correspondence school. Competition of state universities and colleges and bureaus of extension education have led the private correspondence institutions to secure the highest authorities available as text-book writers, and in no case has an author comprehended the need and the opportunity more clearly than Dr. Münsterberg. Another indication of the progressive policy of the publishers is their willingness to sell this and other texts as separate books to the public at large at the reasonable price of \$2 a volume without the necessity of buying a whole "set" of correspondence texts.

HUGO DIEMER.

PENNSYLVANIA STATE COLLEGE.

JOURNALS AND NEW BOOKS

THE PHILOSOPHICAL REVIEW. November, 1915. *The Determination of Human Ends* (pp. 583-602): A. K. ROGERS. - The selection of aims, ends, or social ideals is not made by an appeal to fact, to opportunism, or to custom, nor to science. If science could predict, then it might furnish a criterion, but variation means novelty, hence the future is unpredictable. Ideals are determined by ourselves, that is, they are subjective. *Was Plato an Ascetic?* (pp. 603-613): HERBERT L. STEWART. - Finds justification for the view expressed by Mr. R. W. Livingston in his recent book, "The Greek Genius and its Meaning to Us," that Plato is un-Hellenistic. Plato's predominant mood was Puritanic; "he struggled in vain to overcome what nature had made him." *The Philosophy of Pierre Charron* (pp. 614-630): NORMAN WILDE. - The modern reader of the *Sagesse* is impressed as much by its beliefs as by its doubts. The skepticism of Charron is "Superimposed on a dogmatism as vigorous as itself." This combination of skepticism and dogmatism is explained in terms of an "eclecticism dictated by his pragmatic bent." *Discussion: Pragmatism, Science, and Truth* (pp. 631-638): A. W. MOORE. - A critical reply to Professor Fite's articles on "Pragmatism and Science" and "Pragmatism and Truth." Needs, for Professor Fite, are both "spiritual" and "practical"; for the pragmatist they are all practical. Professor Fite complains that the pragmatist ignores the problem of the independence of truth; for the pragmatist there is no such problem. *Reviews of Books*: James Mark Baldwin, *Genetic Theory of Reality*: EDWARD L. SCHAUB. François Picavet, *Essais sur l'histoire générale et comparée des théologies et des philosophies médiévales*: HORACE C. LONGWELL. John Theodore Merz, *A History of European Thought in the Nineteenth Century, Vol. IV.*: J. E. CREIGHTON. Wincenty Lutoslawski, *Volonté et Liberté*: G. N. DOLSON. *Notices of New Books. Summaries of Articles. Notes.*

Lloyd, Alfred H. *Incarnation: An Essay in Three Parts*. Reprinted from the American Journal of Theology, Vol. XX, No. 1, Pp. 35.

NOTES AND NEWS

In the *Messenger of Europe* (*Vestnik Evropi*, June 1915, Vol. 293, pp. 157-168) there appeared an article by Kovalevsky, entitled, "A Page from the History of our Relation with Western Philosophy." Such an article would be welcome even to the layman, now that Russia is engaged in the "War of the Nations," but to those who are interested in philosophy the article bears a deeper significance, for it enables one to look at Russian philosophy, not as an isolated system, but as having numerous connections with the philosophy of Western Europe. Kovalevsky begins with the influence of Schelling and Hegel on such men as Staukevitch, and the attention given by Herten, Bakounin, Soukhovo-Kolilin, Proudon, Gra-

novsky, B. N. Chickerin, Jemchoujnikoo to German metaphysics, especially Hegelian. From that time on, Russian philosophy has always been in the harness of German metaphysical thought, for the interest in Hegel was succeeded by that in Feuerbach, then in Schopenhauer, and now the topic in the universities is neo-Kantianism, as is especially the case in the lectures of A. D. Uvedensky and I. I. Lopshin. The stream of scientific philosophy, represented by Comte, Spencer, Mill, Lewis, Bain did not interest the philosophers as much as the work of the natural scientists, jurists, historians, writers on descriptive and normative sciences and pedagogues. In this the greatest influence was exerted by the English and the least by the French. As the immediate leaders of the French positivism, opposed to the last attempt of Comte to construct a religio-metaphysical system by means of the subjective method, we may designate G. N. Viroubor and E. V. De Roberti, although their influence in the Romance countries was by far greater than in Russia. The former devoted most of his life to research in chemistry and crystallography, and to lecturing at the Collège de France. He also edited the *Journal of Positive Philosophy*, which began in 1867. But it was De Roberti who did more than any one else to introduce the positive philosophy into Russia and from it proceeded a new philosophical current known as neo-positivism. Kovalevsky devotes about three quarters of his paper to the works of De Roberti. We shall therefore mention a few facts here. In 1869 he published his "Politico-economical Studies," wherein he subjects the current doctrines of the economists to a criticism from the point of view on which Kant insisted in his "Social Statics." But in 1875, in an article in "Knowledge" (Znanie) he showed his difference of opinion from the positive philosophy and sociology of Kant. De Roberti himself regards this article as including the potentialities of his whole philosophy, neo-positivism. In 1880 De Roberti wrote his "Sociology," in which he divides Comte's six sciences of abstract knowledge into disciplines investigating (1) organic, (2) inorganic, and (3) super-organic phenomena. After about twenty-five years De Roberti published his "New Inquiry into the Basic Questions of Sociology," in which he develops his bio-sociological hypothesis concerning the nature of super organic phenomena, raises the question concerning the natural history of Society, as, also, concerning the foundations of abstract sociology. Here he distinguishes four factors of culture: (1) science, (2) philosophy and religion, (3) art, and (4) action and conduct. De Roberti also dealt a blow to agnosticism with his "Unknowable" (1889) and "Agnosticism" (1892). During the later part of his life he preached his philosophy in the psychoneurological institute at Petrograd. Kovalevsky expresses his regret that De Roberti, because of the Russian censure, was forced to publish most of his works in French, instead of Russian. As a result the man who did the most toward bringing the Russians into a closer relation with the philosophy of western Europe, is not sufficiently well known in Russia.

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

SCIENCE AND EPISTEMOLOGY

SINCE the birth of epistemology, science has found little support in philosophy for the affirmed existence of objective truth. By objective truth we commonly denote, as I understand it, a truth in the production of which the psychophysical individual is in no way involved. But epistemology, grounded as it is in psychology, has in this very fact made the existence of an objective truth for epistemology a sheer contradiction. Its sensationalistic principle has been turned and twisted in many a way, since the days of Berkeley, to surmount the limitation. But with a clear knowledge of what is implied by objective truth, ought we not frankly to admit that a *proof* of an objective truth from the standpoint of epistemology is one that has not yet made its appearance upon the evidence of facts that are at once clear and convincing?

The situation is a curious one. There is no truth, says the epistemologist, in the existence of which the psychophysical individual fails to be effectively involved. The physical scientists, on the contrary, have as persistently subscribed to an order of truth from the production of which the psychophysical individual stands excluded. By the aid of some obvious facts, hitherto overlooked, I think I have achieved the solution of this conflict along lines calculated to appeal to scientists and epistemologists alike.

My argument will rest upon the truth of several principles extracted from the field of science. The principles are those (a) of general dependence and (b) of uniform behavior in nature, which, taken together, yield a revised form of relativity. Under the term "pluralism," I shall embrace such additional principles from the methods of science as (c) disconnections and (d) ultimate differences or heterogeneity. As these principles in this conjunction have already been given a full elaboration by me in a series of publications, I shall, after a brief and more completely organized statement of them, confine my attention in this paper to an exposition of the thesis that the psychophysical individual is *not* involved at every point in the determination of reality.

I

Relativity and pluralism are so closely bound up with each other that I shall not, in a statement confessedly abridged, deal with them separately.

The idea most central to relativity is that of dependence. But the idea of relativity involves other specific ideas as well. The fault with philosophy in large measure is a matter of oversight in the correlation of these ideas. But how are we to set about supplying the deficiencies? There is but one way open to us. In the first place, it remains for us to note whether, and if so where, relativity has been given a constructive scope; particularly as the scope granted to it in the past by philosophy has been mainly destructive. In the second place, attention should be directed to a complete analysis of relativity when in its constructive operation.

The first inquiry may be satisfied at once: relativity is the most central idea involved in the methods and in the results of science. A conscious identification of relativity (as it existed in philosophy) with the scientific principles of general dependence marks, accordingly, the first radical step that has been taken in the solution of the problem, and, since my initial¹ presentation of the matter, has been apparently adopted in several quarters. In philosophy the notion of relativity without an exception presented a very abridged conception. Is it any wonder, then, that the scope of its operation in philosophy should have remained of a doubtful value? On the contrary, if we accept the method and the results of science, we must admit that science can not take a single step which does not involve the principle of relativity. It must, therefore, be the principle *par excellence* in the determination of truth.

In answer to the second inquiry, it may be stated in advance of an analysis, that the correlated ideas of which philosophy, unlike science, failed to give regard *in their specific bearing upon relativity* are, (a) uniform action in the behavior of objects, and (b) pluralism, as involving disconnections and heterogeneity.

That dependence is a principle fundamental to all science, may be accepted, I dare say, without dispute. Offer science any object or event and science at once sets about to lay bare the relevant conditions (objects) involved in the existence of the presented object or event. But the fact to be emphasized is not merely *dependence*, but *relevant* dependence. Hence, with science, a given fact is not dependent upon *all* other facts, but only upon *some* other facts. In regard to other so-called irrelevant facts, the given object is affirmed to be *independent*. Relativity in its philosophical formulation, however, has failed to embody such irrelevancy or disconnections with the idea

¹ "Locke a Constructive Relativist."

of dependence, although in science the existence of disconnections, as is evident, is as essential in the discovery of truth as the existence of dependence. These two principles, in science, are coequal in function; and if coequal in function, they are coequal in metaphysical rank. Philosophy, therefore, no matter what its speculative tendency may be, is denied the right to relegate either disconnections (independence) or connections (dependence) to the background. To divorce them, or to exalt the one to the exclusion of the other as metaphysically more ultimate, is to forget, for example, that a disconnection between two objects in chemistry remains a disconnection *in chemistry* even though other kinds of relations may be established between such chemically disconnected objects. In addition to these chemical disconnections, each of the extra-chemical relations in turn would have its own specific quota of disconnections. Empirically considered, therefore, pluralism in the form of disconnections presents an ultimate phase of reality, one that is incapable of transcendence,² however varied or numerous the connections may be that are elicited in our investigation of any part of reality. At the same time, it is to be affirmed that connections are equally fundamental to reality. We infer the existence of connections whenever change manifests itself in a specific group of objects brought into an effective conjunction.³ Accordingly, it is with the recognized existence of a *change* of one type or another that the various causal sciences originate. Thus a chemical change *versus* a mechanical one, when accepted as a certain type of result, gives us the *basis* for an organization among one type of objects (chemistry); the distinction between the beautiful and the ugly, another form of a recognizable result, yields another basis for an organization of our objects (esthetics); and so on indefinitely as we pass from one basis or general distinction in human experience to another, whether practical or theoretical. *The point of departure in each case is the accepted result,*⁴ *whether simple or complex.* The result in turn determines the measure and

² To have recourse to a trans-empirical principle to enforce an ultimate unity is without avail; for in a sphere of fanciful speculation the conclusion that pluralism is ultimate is in no way a less valid assumption than the opposite assumption of an absolute unity or homogeneity. I, however, deny to philosophers the rightful abandonment of the methods and the results of science for dreams, unless a competition at the outset with Grimm and Andersen is also openly declared on the part of a philosopher.

³ By making *change* the distinguishing mark between a causal and a non-causal situation, it is made possible to invest the word "relation" with a more specific meaning, and to offer a proof for an *objective causation*. See this JOURNAL, Vol. XI., page 655, for a fuller elaboration of this contention.

⁴ And the point of departure, except possibly for psychology, is not the psychological immediacy, whatever the form in which it has been so commonly proclaimed.
period.

boundary of the objects constituting its conditions and, like the result, these may be either simple or complex. Accordingly, when I make lemonade I do not combine elements that are simple from the standpoint of chemistry, but I combine the complex thing, water, with the complex things, sugar and lemon juice. From the standpoint of lemonade, they are ultimate.⁵ On the other hand, the so-called elementary substances (hydrogen and oxygen) are ultimate in reference to their capacity to produce water, just as the electrons may be ultimate in respect to their peculiar capacity to produce other specific results. The *conditioning* objects in each case are ultimate in their determination by virtue of the fact that a restricted and special set of conditions is peculiarly requisite for the production of a certain specific result; and the *resulting* object is ultimate in its determination, (a) for the reason that it may function as a condition in some other context of human experience; or (b) for the reason that it is relatively unique and incommensurable⁶ (heterogeneous). In this account, the principles found to be unfailingly present with the principle of dependence or connection are: (1) uniformity in the operation of objects; (2) disconnections; and (3) heterogeneity. I shall deal with these three additional principles in greater detail.

Under the principle of uniformity, science embraces two ideas: (a) that a specific set of conditions will produce a specific result, and (b) that this operation remains constant. *Why* phenomena should behave thus, philosophy, since Hume, makes no attempt to answer; *that* phenomena behave thus is a matter of empirical observation, although recent discussion by anti-intellectualists has rudely questioned the truth of it. In the interest of the present discussion, this challenge may be passed over.

When relativity, therefore, upon the basis of uniformity, suggests the claim that a given object reveals itself differently under different conditions, two things are of necessity implied: (1) that such operation in objects represents what is ultimate and objective, and (2) that

⁵ This JOURNAL, Vol. XI., page 605. Hence, the realist in his assertion that complex things are or may be ultimate, from the presented standpoint, proves himself in possession of a bigger truth than he, left to his own reasoning, could have established. His error lies in his failure to perceive that one and the same object, under changing conditions, may either forfeit or acquire a unity, and hence, in its isolated abstraction, may be termed neither simple nor complex, one nor many.

⁶ Thus, water, in respect to hydrogen and oxygen is heterogeneous. Moreover, water maintains a certain independence for the reason that it can not, except under very specific conditions, be reconverted into hydrogen and oxygen, and, only under still other specific conditions, converted into something else, as, for example, vapor or ice. Water, therefore, remains fixed in a specific determination until the relevant conditions capable of producing a change in it are supplied. This argument, accordingly, yields at least one proof for independence.

the object under consideration is of necessity a synthesis or so-called construct. Upon such ground it is easy to understand that a given object under differing conditions may combine even incompatible qualities. For instance, it is compatible with our notion of gold for it to possess a host of incompatible qualities and properties—a solid or a liquid state; red, green, or yellow; and it may, under different forms, at once have the ability and the inability to combine with an indefinite number of other substances. Each of these qualities and properties, however, in accord with the principle of uniformity, is actually present only in a specific, circumscribed situation or group of conditions. The problem thus forced to the front in the specific determination of objects, as I have already stated in full elsewhere,⁷ is the one-and-the-many problem. The inherent perplexity of this problem is well known. Hence I may assume that one of the significant contributions to philosophy which this corrected form of relativity has to make is that it, by the aid of the principle of uniformity, can yield the ground and proof of *a unity in objects that is objective*, whether we deal with an object of a single group of conditions or with an object that is constructed on the basis of many different groups. Thus gold, in the hand of the chemist, acquires a determination that is not only definite and specific, but as fixed in its determination as the principle of uniformity is fixed in its specific and invariable correlation of a specific result with its specific conditions. I do not, of course, claim for relativity on this point an unlimited capacity to illuminate; but I do claim for it the merit of doing for the one-and-the-many problem what no other principle has as yet succeeded in doing. Thus pragmatism, for example, has failed to meet this demand for unity in its use of such principles as “needs,” “habits,” “purpose,” “satisfaction,” “whatever works” as evasions of or as substitutions for the principle of uniformity,—terms not only subjective in their connotation, but they, in any properly organized form, are wholly within the control of the principle of uniform operation in objects. In so far, then, as relativity incorporates the idea of uniform operation in objects, it embodies a principle that is fixed, ultimate, and objective. Hence, to call uniformity itself into question, constitutes no special argument against relativity. The argument, if true, would overthrow every form of science.

In the idea, “heterogeneity,” another distinct aspect of relativity comes to the surface—an aspect of objects more properly described by the wider term of pluralism. I have already dwelt sufficiently upon one aspect of pluralism—the existence of disconnections among objects,—in virtue of which property objects may be termed “neutral” or “ineffective” in respect to other specific objects. One can

⁷ This JOURNAL, Vol. XI., pages 603–07.

not view without surprise the fact that this obvious commonplace of the methods of science should have escaped an appreciative understanding by philosophers expounding metaphysics.

It is another aspect of pluralism, however, to which I wish here to draw attention; namely, that fundamental differences must be assumed to inhere in objects, in virtue of which fact alone we can maintain *differences in results* and *differences in conditions*. Hence deny ultimate differences (or heterogeneity) of objects and the scientific formula in question, with its possibility for an organization of objects, vanishes. An organization of objects, upon the basis of the formula in question, primarily implies a partiality; and a partiality among objects lacking in differences that are inherent and ultimate would be a partiality without either pith or meaning. General chemistry establishes such differences as ultimate in the case of eighty or more so-called elementary substances. Physical chemistry in the number of substances considered by it as ultimate far outstrips general chemistry. And recently, the new science of colloids, another department of chemistry, has fixed upon still other aspects of reality as ultimate. This science of colloids in particular comes with an unusual enlightenment for one wearied by the monisms of philosophy. But why pause to multiply instances of the above order! For, once clearly fix upon the fact that the point of departure in any organization of objects is a given, more or less, basic *result*, and one can easily understand why the three mentioned departments in chemistry fail to conflict with or to neutralize each other. It also serves to explain the further fact why the exponents of the sciences mentioned, as a unit, should further maintain, for example, that the theory of electrons emanating from physics in no way undermines or challenges their respective sciences. The truth is, in fact, that no matter of what order the distinction is that lies at the basis of a specific science, provided the distinction is real, the principles of dependence and of heterogeneity remain equally implied and assumed in all scientific explanation. For, if the distinctions at the base of each science were not of a heterogeneity that is ultimate, the distinction between one science and another would be a mere makeshift. But if the distinctions at the base of any science are ultimate, then the distinctions between each of the sciences are ultimate. The danger in dealing with a problem of this kind is that we are too apt to deal with it in the abstract. Instead, let us take such a trinity of closely related sciences as general chemistry, physical chemistry, and the science of colloids, and the fact at once disclosed is that the specific properties and qualities of objects that come into existence from the standpoint of one of these sciences *cease entirely to exist* when the same general substance is dealt with from the standpoint of either of

the other two sciences. And the reason thereof is obvious: *specific* conditions are requisite for the existence of certain *specific* results. Hence, however questionable or uncertain the boundary lines may be between the three sciences in question, we do not *resolve* the one science into the other when we set about to embrace them under one term. We merely, perchance, *incorporate* them. For if we would avoid a loss of any quality or property distinctive of any one of them, it would be necessary to incorporate them in such a way that each would have its own specific groups of conditions preserved intact. But such an incorporation (in essence) would be a matter of mere addition or aggregation; it certainly would not, at bottom, be a matter of organization, that is, a unity of the type so familiar to speculative thought. The attempt, therefore, to *resolve* all of reality, let us say, into psychology (the offense of present-day epistemology) is just as blind and absurd as to resolve the whole of psychology into chemistry or physics, or all of the sciences, each with its own more or less unique and incommensurable basic distinction, into a supreme science, so-called philosophy. I shall proceed to prove that relativity, as formulated, is in a position to correct the generally accepted psychologized epistemology.

II

A little truth, observed or neglected, throws a big shadow in philosophy. It is my aim to show that a truth, hitherto unobserved, but with consequences no less significant, characterizes epistemology. Hypnotized as epistemology has been by the subject-object relation of psychology, it of necessity failed to take due note of the object-object relation; or, when epistemology chanced to take note of the latter relation, it construed the relation solely in terms of the results gleaned from the subject-object relation, as if the object-object relation had no special contributions of its own to offer. The outcome thereof is our psychologized epistemology.

A statement of a few simple facts, taken at random from chemistry, will suffice to establish my contention that *sensationalism, in whatever form, does not exhaust the cognitive elements utilized in the differentiation or determination of objects*. Kant has already shown that certain abstract ideas are thus implied in human experience. The distinctions that I shall insist upon, however, are not abstract in character, but, on the contrary, very definite and concrete. I accept Kant in this contribution to philosophy just as I, to a certain extent accept Berkeley in his formulation of perception and existence. The ideo-motor theory in the hands of pragmatists, I also accept; but I deny that the ideo-motor theory supplants Berkeley; it only serves to place the outcome of his philosophy upon a broader psychological basis than the more narrow sensationalism had already

achieved. But one set of non-sensuous distinctions has escaped detection,—the distinctions that come to exist in objects in virtue of a *variety in their operations* when they are brought into some form of a causal or non-causal relation with each other. To record such differences, as we shall see, is the central business of chemistry.

As stated in the pages preceding, reality for science is determined in circumscribed situations, in so far as we hold (a) to the formula that a given result is a product of specific conditions, and (b) to the principle of elimination as it is involved in all inductive reasoning. Opposed to this formula, epistemology asserts that the psychophysical individual is a factor that is not only constant, but also central in the determination of reality. Hence the question is at once raised: Is the psychophysical individual, as epistemology presents the matter, the one object that is immune to the "elimination" in question? I shall deal with the problem in the concrete.

I turn to the chemist and ask a simple question: Water is the product of what objects? He replies that hydrogen and oxygen in certain proportions, when united by an electric spark, produce water. He also informs me that when nitrogen is combined with oxygen, water will not result; nor will any other substance when combined with any other substance (except H_2O) succeed in producing water. Now grant that a psychophysical agent is present in each and every one of these situations. But how can its presence alter the matter? For the thing primarily concerning the chemist *in reference to water*, is the question whether the psychophysical agent or whether some other principle, as oxygen, nitrogen, or silver, is directly involved in the origin of water. If the psychophysical agent, rather than oxygen or hydrogen, were the determining factor, it would follow that the psychophysical agent was upon a par, and merely upon a par, with the eighty or more elementary substances which chemistry enumerates as primary in its investigations. In this case our formula for water would be: "the individual + H_2O + the electric spark." On the other hand, the formula, "the individual + nitrogen + silver" would be incorrect. But if the psychophysical agent is an unchanging coefficient in the situations which *fail to produce* the result and also in those *competent to produce* the result, what possible reason would the chemist have for regarding it as the *solely* central and significant factor in the formation of water? The distinction here between what is significant and what is negligible in the situation is too obvious for even the dullest among the chemists to confound. *In respect to the origin of water*, hydrogen and nitrogen *are different* and the psychophysical agent *is neutral*, the facts are obvious. What, then, are we to say of a doctrine that affirms that the psychophysical agent is the primary and solely sig-

nificant factor in the given situation? The psychophysical agent *in respect to the given result* is neutral, in the first place, for the reason that it is not "effectively" involved in the production of the specific result: and, in the second place, for the further reason that the *type of differences*, instanced by hydrogen and nitrogen in respect to water, *is of a strictly non-sensational order*, distinctions, both of them hitherto unregarded by epistemology. The chemist, therefore, would not have been justified in following the epistemologist in so patent an oversight of chemistry's own special problems and distinctions. Thus in a manner akin to his necessitated indifference to psychology and epistemology, the chemist is inclined to ignore a mere mechanical mixture as over against a chemical one; or again, he is inclined to ignore the shape and size of bodies as over against their merely substantive character. Accordingly, we find in every text-book in chemistry that the shape and size of objects are deliberately excluded from its field, on the strength of their irrelevancy to its specific subject-matter. Why, then, should not the chemist, upon even more established ground, have felt himself safe in excluding the boasted claims of epistemology? The failure of epistemology to investigate the object-object relation explains its incapacity to give proof and meaning to the notions of *independence* and of *non-sensational differences* in objects. It also explains the fact why the more or less objective principles and distinctions, for which chemistry in its turn most specifically stands, failed to receive a proper recognition in philosophy. The muddle thus induced by epistemologists in the sphere of chemistry, however, served less to confuse than to disgust the chemist with the arrogant claims of epistemology. The chemist's repudiation of epistemology now proves to have been a sound one. For when once the chemist has accepted a chemical change as a *type of change* that is distinctive, the only principles that he is validly called upon to recognize are (a) that a given so-called chemical result is the product of certain specific conditions. These conditions in turn become disentangled and organized. And in so far as he thus simultaneously adheres to his special type of change and to this principle, the only other principle to which he is called upon to adhere to is (b) that those conditions that are present when the phenomenon is present and absent when the phenomenon is absent are the solely central and significant conditions in the production of a given phenomenon. Generalizing, then, we may conclude that science is correct in its claim that the individual is not of necessity involved in the determination of all reality; and its claim remains correct to the extent in which science can find, and thus come to deal with, *objects whose interaction with each other is of more primary*

concern than their interaction with a psychophysical organism. The physical sciences as a whole stand for the former type of interaction, and, in their results, they have come to exemplify principles that maintain *an independence of the psychophysical organism in their operation*. Nor does the fact that a psychophysical organism is a factor that is present in each and every situation under investigation in any way supplant the distinction that hydrogen and nitrogen *act differently in respect to water*, and are therefore *significantly different*, not in color, weight, or some other sensational quality, but *in operation in respect to water*. The type of differences in question is, of course, revealed to us in consciousness, but it is not revealed in terms of the psychophysical. The whole issue centers in this distinction.

It is true that the elementary substances of chemistry may and do become identified and differentiated within principles that are obviously psychological (sensational) in character. But the other fact remains equally patent, that they acquire a further differentiation and organization in harmony with principles that are in no way to be classed as psychological. I have already sufficiently enlarged upon such non-sensuous principles in connection with independence *versus* dependence and in connection with the varying capacity in so-called different objects to aid in producing a given result, or to fail to thus operate. And, what is more, the existence of such non-sensuous principles must be accepted, until we become able, if ever, to tell in psychological terms *why* hydrogen and oxygen in certain proportions will produce water and *why* other objects fail to do so.* All we are permitted to say is that hydrogen and oxygen will produce water; oxygen combined with nitrogen will not do so. Here, then, as clearly indicated, *are differences in the operation of objects* which we, as philosophers, ought not to have overlooked. The oversight is all the more puzzling, because the distinctions concerned are so very simple and obvious in their statement, and, at the same time, so central in a science no less eminently concrete than chemistry. In their contrast to psychological principles, the chemist has been led to call them objective. Let the psychologist dispute him if he can or, out of his possible psychological resources, provide for this oversight of the past.

Naturally, every observed object, as stated, involves cognition. But my contention is that a distinction may be affirmed within cognition between psychological and non-psychological elements or principles of knowledge. This, of course, could not be the case if cogni-

* Do not mistake my contention. The chemist does not attempt to say *why* objects manifest the differences indicated. He is merely interested in the result that objects, identified by him as different, do *operate* differently, and to tabulate these *differences in operation* practically exhausts his interest.

tion were not affirmed to be at once distinct from and in part at least *independent* of mere sensational data. My present proof for non-sensational elements of knowledge, observe, does not, however, pause with this more or less deductive type of reasoning. I merely make a demand for an observation of the fact that a psychophysical organism is "neutral" in its capacity to act on a par with the elementary substances in chemistry to produce a *chemical* change, and, secondly, that the psychophysical organism is unable to yield the elements for the differences affirmed to exist between the chemical substances in their reciprocal operations. For these reasons I have been led to assert that the psychophysical organism is like every other object in the universe; that is, it is at once "effective" in respect to some results and "neutral" in respect to others. And it is upon this distinction in the human organism as "neutral" and as "effective" in its relations to different objects, that I would justify the claim of chemistry to eliminate psychology from its cognizance. Cognition or awareness, therefore, has a wider scope than is provided for by the historical development of epistemology. In fact, for the very same reason that philosophy turned to psychology to prove a dependence of certain elements in cognition upon an organism, it should also have turned to other sciences for the proof of elements in cognition not thus psychologically dependent. This I now claim to have opened the way to do. Until we can give in terms of sensations *why* hydrogen and nitrogen are different in respect to water and yet treat them as different, as we do in chemistry, then we must stand ready to admit either that chemistry presents no valid form of knowledge, or that non-sensational elements in the differentiation of objects exist in cognition.

In a similar manner, it can be shown that a *chemical* change distinguishes itself from a merely *mechanical* change by the help of non-sensational rather than sensational principles. Both kinds of change, no doubt, involve the presence of sensational elements; but a *further* differentiation is affirmed to exist between them, and this further differentiation is one that is based upon a difference in objects more properly denoted as functional than structural (substantive) in character. Had chemistry affirmed that the distinction between a mechanical and a chemical change was one that at bottom is metaphysical, the chemist would, without more ado, have put his science at the mercy of philosophy. But chemistry, fortunately, did not thus easily abandon its sphere. Hence, the first distinction that chemistry is actually found to make between a chemical and a mechanical change is that the latter is essentially reversible (as he terms it) whereas the former is not; secondly, that the former involves more heat energy than the latter. Thus we see that even

in his definition of change, a chemist's interest in objects lies primarily in their functional aspect. He accepts the distinctions that he thus makes as final and reliable. After that his sole business is to separate those objects that combine (in accord with the principle of uniformity) in the one way from those that combine in the other way, or in neither way. A psychical change might thus be taken as representative of a type of change neither chemical nor mechanical.

If now we raise the question whether a psychical or a chemical change is the more ultimate, the conflict between monism and pluralism would at once confront us. Without seeking to reopen this issue, all that remains to say is that a psychical event to all purposes is as unique and as distinct an event as a chemical or mechanical one, and, hence, may as validly serve as a basis for a science. It is not surprising, therefore, that certain sciences have arisen in which the attainment of truth has for its prescribed ideal the inclusion of just that psychophysical element which the ideal of the physical sciences seeks to eliminate. Psychology, ethics, esthetics may be cited as some of the sciences falling within the sphere of this latter ideal. Their subject-matter may be subjective, but if expressed in terms of the uniform behavior of objects, the truth achieved is objective. In current usage, however, some truth only is objective and some subjective. Truth, by common agreement, is subjective to the extent in which a psychophysical individual, as an "effective" object, obviously contributes⁹ in the production of sense phenomena; but in so far as the individual is not an "effective" condition in a specific production, but a medium of transcription only, to that extent, by common agreement, truth is objective and not subjective. Instead of this definition of objectivity, I would offer the principle of uniform behavior in objects as formulated. Secondly, science has been led to subscribe to the existence of a truth, in the production of which the human organism fails to be "effectively" involved. That such situations exist, is the long-standing claim of the physical sciences; but science has been unable to justify its claim in the face of the contention, advanced by philosophy, that the individual is directly involved in each and every observed situation. Neither has philosophy been able to justify its claim in the face of the methods and the results of science. Both science and philosophy are thus found to be lacking; and their lack is due to the fact that they alike fail to distinguish, and to give the ground for the distinction, between an individual that is "effective" in certain situations and "neutral"

⁹ I use the word "contribute," for the reason that every "cause," in my judgment, is *plural* and not *one*, as set forth in my paper on "Causation" in this JOURNAL, Vol. XI., page 655.

in others. The proof thereof demands the acceptance of relativity and pluralism at every point.

III

One objection to the position herein advanced may be met at once. Grant that non-sensational principles of knowledge exist, how avoid subjectivity in knowledge from the standpoint of thought as constitutive,—the claim of so-called objective idealists.

This objection is to be overcome by a purely empirical procedure. The question at issue is: Is every object in its apprehension transformed by thought? This claim, to my mind, stands refuted if we can again empirically show that thought is a principle that is controlled as well as one that controls in our conception of reality. A mere outline of my argument must again suffice.

Suppose we ask the question whether water is simple or complex, one or many. To answer this question we must turn to something else than water. It is "one" from the standpoint of lemonade; "many" from the standpoint of physics or chemistry. If so, it is not left to thought upon its own initiative to apprehend water as either one or many. On the other hand, thought is constrained by an inexplicable behavior among objects, to denominate water as "one" in relation to lemonade and "many" in reference to hydrogen and oxygen.¹⁰ Hence thought is controlled.

Or again: suppose I hold that nitrogen and silver will produce water. How would you expose my error? Merely by challenging me to make my statement good; that is, to produce water from nitrogen and silver. This, of course, I can not do; but water can be produced by the help of hydrogen and oxygen. If so, where does the principle of control lie in the formation of a correct idea in respect to the origin of water? Does it lie in thought as ultimate or in the inexplicable but uniform behavior of objects? And since my aim in passing is merely to suggest to what extent thought is *not* constitutive, this division of my paper may be brought to a close.

The path is now open for grappling successfully with the appearance-reality problem of historic thought.

IV

If reality is assumed to be inherently pluralistic and relativistic, then it follows that reality reveals itself in circumscribed situations only. And since *time* and *varied situations* are alike required in the manifestations of reality, no matter what bit of it we seize upon, then one sample of it, as the product of one situation only or of a series of different situations, is no more real in the abstract than

¹⁰ Hence a so-called "result" would control so-called "purpose." To this extent, therefore, do I venture to correct and supplement much of our current philosophy, particularly pragmatism.

another, or, to state the matter in positive terms, it is just as real. We have no block-universe for our standard. Our only standard is the one that is found in the correlation of a specific result with its specific conditions. The block-universe conception is thus not only superseded as a standard for the attainment of truth, but it is refuted by reality's inherent plurality. It is further refuted by the fact that *time* and *different* situations are required to manifest all the qualities and properties of even the simplest parts of reality. Hence the more complex the reality that is assumed, the more persistently the principle applies, that time and different situations are absolutely necessary for manifesting all its various properties and qualities.

Now, if reality manifests itself in circumscribed situations, why should that product of reality of which the psychophysical individual constitutes a *productive* part, be called an "appearance," and those circumscribed parts of reality that are determined independent of an "effective" psychophysical individual, genuine reality? There is no basis for such a contention, except the false one that the universe and every object in it exist in their isolated abstraction with a prefixed measure and boundary, and that the psychophysical individual, accordingly, is a sheer epiphenomenon as far as his part is concerned in the constitution of that universe. But once admit, as I have tried to establish, (1) that reality at large is not such a prefixed block-universe; (2) that it manifests itself in circumscribed situations only; (3) that the individual as "effective" and "neutral" is but one object among others, and hence as much as any other object an integral part of such universe; and (4) that the contributions made by a psychophysical organism in an object's constitution is of the same general order as the contributions from any other object,—then the appearance-reality distinction as metaphysical, the most persistent delusion of historic thought, vanishes forever, except the distinction be retained for practical reasons.

In fact the appearance-reality distinction, when considered in the light of the relativity herein formulated, converts itself into a thing the very opposite of that claimed for it in our historic development of thought. For if that reality, in which man is more directly involved, is more real for him than a more independent form of it, then the supposed "appearance" of historic thought converts itself into the superior reality, and the supposed "reality" into the inferior.

The conclusions that follow are that civilization with its organized reality is for us of a richer content than less organized reality; and secondly, that the world, as well as the individual, is inherently creative and destructive.

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THE PERMANENT CONTRIBUTIONS OF THE PRAGMATISTS

THE word pragmatism is familiar to all students of contemporary philosophy. So much has been written about it during the last ten years that even the uninitiated must have a pretty definite idea of its aims and assumptions. When, a few years ago, the word pragmatism was first heard in philosophical circles, its denotation was to most of us vague and indefinite. Now, however, after the new doctrine has enjoyed ten years of popularity, it is time to throw a retrospective glance upon the past, and to examine its claims to a permanent place in the history of philosophy.

Let me state at the outset that I do not take the word pragmatism to mean a definite, closed system, nor do I intend to draw a hard and fast line between it and its neighbors. No word in our language expresses a single idea, definitely separated from all others. All our vocables express currents of thought, some stages of which our dictionaries endeavor to stereotype. But the task is impossible. These currents of thought move on; and, in time as well as in space, reflect the instability of their nature. The word *ἀγαθός* which, among ancient Greeks, meant good, is now translated by their descendants as meaning good-natured, and no doubt it will soon convey the idea of silliness. Even if we confine ourselves to the present time, we are struck by the flowing character of our words. Dictionaries endeavor to take different views of the flow and to give to each word a number of different meanings. But the word itself is the moving unit which no photographic apparatus can represent.

It is not, therefore, to be wondered that the word pragmatism should have embraced at the outset different, nay incompatible ideas. It is well known that the man to whom the paternity of pragmatism has been so repeatedly attributed, Charles Peirce, frightened at the apparent transformation of his child, refused to recognize him any longer, and enriched philosophical dictionaries with the name pragmaticism, which, in order to avoid confusion, he destined to the original—and, according to him, sole legitimate—form of his offspring. William James himself, although less timid, did not fail to recognize the progress of the doctrine with which his name had been so gloriously associated. When Schiller, in his volume on Humanism, so developed the pragmatic ideas as to convert them into a complete philosophical system, William James, although he defended with all his main his English confrère, could not but see that there was an abyss between such a humanism and his own original, timid principles.

Nor do I believe that a satisfactory list of pragmatic philosophers could be drawn. William James no doubt identified the word prag-

matism with his own philosophical achievements. But it is a remarkable fact that none of the other philosophers we generally classify with him has done so. So far as I know, Professor Dewey has never called himself a pragmatist. As for Henri Bergson, it has been repeatedly asserted that he is not one: "M. Henri Bergson n'est pas pragmatiste," wrote Chaumeix, "on ne trouve chez lui ni le mot ni la chose." When, a few years ago, Mr. Pitkin pointed out in this JOURNAL, some points of divergence between the doctrines of James and Bergson, the author of the "Evolution créatrice" came bravely to the rescue of his American confrère and the discussion was apparently closed. It is, however, significant that many students of philosophy were not convinced and obstinately refused to classify Bergson as a pragmatist. On the other hand, P. Nève, in a remarkable essay on the philosophy of Bergson, which appeared in the first volume of the "Annales de l'Institut supérieur de Philosophie," sees in Bergson's philosophy the definite, permanent form of pragmatism, the form which is destined to endure and to have a permanent place in the history of philosophy.

The truth is that all classifications are creations of our mind manufactured for practical purposes, and, therefore, they are to some extent untrue. Each philosopher is but his own self. He has his own philosophical system, more or less consistent, more or less profound; a system, however, which is different from all others, and only for practical purposes, can be assimilated with neighboring currents of thought. And this is why philosophers hate to be classified. They feel that an injustice is done to them. James lived and thought and had a conception of the universe. The same is true of Dewey and Bergson. Each one has his own system, differing, in many respects, from all others. Strictly speaking, pragmatism does not exist.

When I speak, therefore, of the permanent contributions of the pragmatists, I simply mean some permanent contributions to philosophy made in modern times, and chiefly insisted upon by some philosophers whom we more or less arbitrarily classify as pragmatists.

When William James began to popularize pragmatic ideas, he described pragmatism as being simply a method for judging of the truth of doctrines through their practical consequences. Pragmatism stood for no philosophical system whatsoever, and the Italian Papini, bolder than his master, likened it to a corridor which opened into all systems of philosophy. Not long afterwards, Professor Lovejoy was able to describe thirteen forms of pragmatism.

The essential character of pragmatism was, however, according to William James, its consideration of practical results. "The pragmatic method is primarily a method of settling metaphysical disputes that otherwise might be interminable. Is the world one or many?—

fated or free?—material or spiritual?—here are notions either of which may or may not hold good of the world; and disputes over such notions are unending. The pragmatic method in such cases is to try to interpret each notion by tracing its respective practical consequences.”¹ And the principle that “the true is that which works” seemed at first to take the world by storm. But its glory soon faded away. At the Congress of Heidelberg, in 1908, pragmatic doctrines met with decided hostility. According to Dr. Itelson, pragmatism is the philosophy of those who are not philosophers “*nur Laien kann der Pragmatismus gefallen.*” And at the same Congress, pragmatism was described as a kitchen-philosophy “*Pragmatismus ist eine Küchenphilosophie.*” More recently, at the International Congress of Philosophy of Bologna, there arose the general impression that Schiller was not even taken seriously. And now, only five years after the death of William James, who is not struck by the contrast between the noisy reputation he so rapidly acquired during his life and the silence which now reigns around his tomb?

Let us frankly confess the truth. Of all the aspects of pragmatism, the one which James mostly emphasized, namely, the consideration of practical results, is precisely the one that is bound to disappear. It has been pointed out by a French philosopher, whom pragmatists occasionally classify as one of their number, Gaston Milhaud, that the disinterested character of scientific speculation is an essential condition of its progress. As long as mathematics, in the hands of the Egyptians, were directed toward practical results, they remained stationary. When, however, the Greeks, neglecting practical results, applied themselves to pure, disinterested speculation, gigantic progress was made, and seemed always to be in a direct ratio with the degree of disinterestedness and the purely speculative character of the scientific researches.

Among the permanent contributions of the pragmatists, there are two which I regard as most important. One of them is the temporal character of reality, as contrasted with the eternal, immutable character of the same described by the absolute idealist of the last century. The other is the human element in the building up of reality.

The first of these contributions does not belong to pragmatism alone. It is a tendency found in all contemporary thought. Nobody perhaps has pointed it out more clearly than Professor Woodbridge, whom no one would classify as a pragmatist. According to Woodbridge, the theory of the absolute idealist was connected with the physical discoveries of Newton and the astronomical achievements of Copernicus and Laplace. In virtue of these achievements, space was regarded as the real being, in terms of which all cosmic phenomena were to be described. Duration came to be regarded as

¹ James, “Pragmatism,” page 45.

non-essential and dismissed from the philosophical platform. As there were written, inspired by such ideas, Kant's "*Kritik der reinen Vernunft*" and Addison's hymn "*The Spacious Firmament High*." Now, on the other hand, since Darwin has turned the attention of scientists toward the evolutionary character of reality, the conception of space has ceased to be a dominant conception and has made a solemn entry into the realm of philosophy. It is the world as becoming, not the world as "all there," which philosophers are now found to consider. It is Darwin's picture which has replaced Newton's.²

In point of fact, the theories of the absolute idealist can be traced back to a far remoter past. Since Parmenides drew a sharp line between the real world and the world of appearances, the conception of a permanent, immutable reality which persists through the fleeting phenomena has found a place in the philosophical systems of all ages and all nations. In ancient Greece, there was Plato with his world of ideas, and, during the Middle Ages, the schoolmen, developing Aristotle's theory of the pure act, reached the conception of an eternal, immutable Absolute, which alone in which all cosmic phenomena, all worldly changes, have their origin and their ultimate cause. The Hegelians have a similar conception of the Absolute. But whereas the God of the Scholastics was inaccessible to the human mind only to a limited extent, the Hegelian philosophy rests on the belief that, by analyzing the logical elements of reality, they can unfold the Divine Nature and discover its archaic cause. By the way, has pointed out more clearly than Professor Bergson, such a subtle anthropomorphism is the stumbling-block of Hegelian philosophy.

Pragmatists have been unanimous in discarding the immutable Absolute and in directing their attention to the changing character of reality. Bergson, in particular, has given us "*l'évolution créatrice*," a philosophy of evolution of which duration can be considered as the backbone.

This shifting of the philosophical point of view has brought about a transformation in our conception of thought and in the rest of things. Since the days of Descartes, a chasm has existed between the mind and the external world, which has been unable to span. And the ghost of solipsism was there, unable to drive it away. But now that thought has entered into the world's history, to the same degree as a strong earthquake, the problem of the bridge between the mind and the world is bound to disappear as meaningless. This is why Bergson simply sketches the natural history of thought in it

² Cf. Woodbridge, "*The Problem of Time in Modern Philosophy*," *JOURNAL*, Vol. VII., pages 410 seq.

ing with the antecedents of thought, then passing to the datum of thinking, ending finally with the content and objects of thought.

The other permanent contribution of the pragmatists to philosophical thought does not appear upon the platform of any other system, and may, therefore, be regarded as its exclusive property. It is, as we have already hinted, the human element in the building up of reality.

When, for the first time, our remote ancestors formulated the laws of nature, they believed they had deciphered a page of the eternal truth. For centuries they prided themselves upon having discovered the ideas of the Infinite. But, in the course of time, their joy was brought to an end. The laws they had formulated were rejected, and new principles advocated, more in harmony with recent scientific discoveries. The new laws partook of the same fate, and at last men, delivered forever from the presumption of their ancestors, came to consider scientific laws and formulas as hypotheses, which could be accepted only temporarily, as guides in the discovery of new truths. This is why pragmatists reject all descriptions of truth as eternal and immutable, and insist upon the part played by man in its creation.

When we reject an old law and put a new one in its stead, we do not thereby affirm that the old law was false and that the new one is true. Both are true to a certain extent. Both have the same right to be considered as scientific, in so far as they account for established facts and lead us to the discovery of new truths. Both are only temporary in character, because there is always present the possibility of new discoveries which will make a new formula imperative. The Ptolemaic system of the universe was as strictly scientific as the Copernican system. By its means, the ancients accounted for the different positions of the planets. They did so by referring them to the earth as to a center. To-day, based upon the principle that the earth moves around the sun and that the sun is motionless, we account for the same positions of the planets by referring them to the sun. But the motionless character of the sun is only a fiction, and possibly some day a new cosmical theory will replace the heliocentric system, which, although more perfect than the Ptolemaic, is nevertheless to a certain extent arbitrary.

The same arbitrary character is found in all other sciences: in biology, in history, in philology. In them all we classify for convenience sake, following the bent of our intelligence which could not otherwise embrace reality. In biology, we divide living beings into animals and vegetables. But we are bound to confess that between the animal and the vegetable kingdom no hard and fast line can be drawn. We are even at a loss when we want to formulate any essential characteristic which distinguishes the one realm from the other.

According to the scholastics, the animal is that which moves itself. But many beings endowed with motion are classified as vegetables. Without mentioning the insectivorous plants, which are able to get hold of insects and to digest them, we are all aware of the fact that many bacteria are endowed with free and spontaneous motion. And yet bacteriologists are unanimous in classifying them as belonging to the vegetable kingdom.

Nowadays biologists have come to the conclusion that the most characteristic difference between the animal and the vegetable kingdom lies in the mode of alimentation. The vegetable is able to assimilate simple elements, whereas the animal feeds upon organized bodies. But here again, many cases can be adduced in which the law does not hold. Although bacteria are able to obtain their nourishment from much simpler chemical substances than most animal cells, yet they can not use some of the substances which are assimilable by the green plants. Moreover, who ignores that the *drosera*, the *dionæa*, and the *pinguicula* can feed upon insects, and that mushrooms have the same mode of alimentation as animals.

This arbitrary character of scientific truth is found not only in general laws. In all our perceptions we choose between images, we accentuate some, we neglect others, although they all possess the same interest in so far as pure knowledge is concerned. We thus more or less arbitrarily divide the material world into independent bodies. But their independence is fictitious and created by ourselves for practical purposes. And thus, as James puts it, the world is really malleable, waiting to receive its final touches at our hands. Man engenders truths upon it.

The Italian pragmatist, Papini, enthusiastic at the sight of this newly discovered rôle of man in the building up of the body of scientific truth, grew dithyrambic over the view that it endows man with creative, divine functions. Bergson is more modest. According to him man, it is true, creates the world of science. But, in so doing, he deforms reality to a certain extent. And the function of philosophy is, therefore, to undo what science has done; and, forgetting that we are intelligent beings, to try to penetrate by means of instinct into the pure, virgin reality which the hand of man has not touched.

Pragmatism has conquered a permanent place in the history of philosophy. Some of its early contributions are, in my opinion, destined to die; and I would place among these the belief that the truth of a theory is to be found by tracing its respective practical consequences. But the pragmatists will ever have the glory of having pointed out the human element in the building up of the body of scientific truths. To them belongs the honor of having accurately expressed the value of hypothesis in science. Moreover, they have

insisted upon the importance of time in all philosophical accounts of reality, and have thereby associated their name with the philosophy of evolution.

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REVIEWS AND ABSTRACTS OF LITERATURE

Science and Religion: the Rational and the Superrational. CASSIUS J. KEYSER. New Haven: Yale University Press. 1914. Pp. i + 75.

In this little book, which represents an address delivered on May 4, 1914, before the Phi Beta Kappa alumni in New York, Professor Keyser gives us a remarkably interesting and stimulating account of the relations between science, religion, and the extent of human knowledge, as seen from the point of view of an expert in the theory and technique of modern mathematics. He starts out by distinguishing scientific from religious knowledge in that the former deals with "a certain group of concepts, together with the relations that bind them into a logically organic whole," while, at bottom, religion is "a complex of emotions felt in their integrity," and "does not belong to the rational domain, does not pertain to the field of logic." To put the same idea into other words, scientific knowledge is connotative, religious knowledge is denotative, and therefore logic, which is the science of the interconnections of connotations, is irrelevant to religion. As the author shows, the scientific knowledge of religion is a far different matter from the knowledge of religion which the religious man possesses, for, though the subject-matter of the knowledge may be the same in both cases, the former is knowledge *about* its subject-matter, while the latter is acquaintance with its subject-matter. Professor Keyser gives a very interesting and very thorough discussion of this point, though, with perfect justice, he lays considerable emphasis on the fact that in our actual life these two elements—the direct awareness we have of our own feelings, and the scientific, descriptive, connotative knowledge which we may have even of religious experience—are closely intermingled.

The next thesis considered in the book is "that human ignorance is a necessary condition for the existence of religion." Professors Gilbert Murray and Shotwell are mentioned as advocates of this view, which is discussed in connection with the other familiar opinion that human knowledge is destined to develop beyond all bounds. Professor Keyser deems this latter tenet characteristic of the present age, but is not convinced of its soundness. Leaving all questions as to the validity of this view aside, however, he holds that in some more or less metaphorical sense, the amount of the unexplored in the universe—which, according to a view just mentioned, forms a necessary factor for the existence of religion—is infinite. He points out, in accordance with the Tristram Shandy paradox of Mr. Bertrand Russell (whose name is accidentally not mentioned in this connection), that the infinitude of the unknown in the universe and the fact that at no time will the human intellect have

exhausted it, may be perfectly compatible with the hypothesis that every single fact in the universe will be learned sooner or later. He also indicates that "it is far from evident that, for the intellect of man, every specific knowable is convertible into a known," while he puts forward the further claim: if it be granted that the sum total of human knowledge is not capable of being extended so as to include any part of the universe, you please, though the possibility still might remain that the sphere of the humanly knowable is infinite, though not all-inclusive, even this reduced assumption concerning the unbounded extent of the humanly knowable is extremely questionable. He next presents the alternative view that though the sum total of the humanly knowable might be finite, human knowledge might go on forever approaching it asymptotically. How this alternative is to be distinguished from the last is somewhat difficult to make out, since, by the author's own confession, we are using terms of measurement such as "finite" and "infinite" in an extremely metaphorical and loose sense.

Professor Keyser now returns to the discussion of the hypothesis that the humanly knowable is infinite and includes the whole universe, combined with that assumed throughout up to this point: that religion depends upon human ignorance. He claims that it is possible for the *quantity of the unknown*, which has been assumed to form the basis of religion, to remain absolutely unchanged, on account of the infinitude of the unknown, though every item of fact in the universe becomes known at some time or other. He brings out the difficulties which would ensue were the future duration of the human race on this planet finite, or were time cyclical in its course, and not, so to put it, rectilinear. Herewith he closes the first and most satisfactory part of his argument, which, even if it is too metaphorical to have settled anything finally, is a most interesting discussion of the relations of the known to the unknown. The conclusion is that under none of the hypotheses already considered do any conflict arise between the "limitless progressibility of human knowledge" and the view that religion "essentially depends for sustenance upon human ignorance."

This latter view is now denied. Professor Keyser's chief reason for denying it is by no means satisfactory. It is this: an omniscient being, on the theory that religion depends on ignorance, having no ignorance, can have no religion. But, says the author, religion furnishes one with certain experiences that the non-religious being could not have, so that if a being is omniscient, and consequently possesses all possible experiences, it must possess these experiences, and must consequently have religion. Professor Keyser sees a contradiction in these two conclusions—that an omniscient being, on the one hand, must not have a religion, and that, on the other hand, an omniscient being, must have a religion—and argues on the basis of this contradiction that the theory that religion depends on ignorance is false. But this argument is fallacious, for the two conclusions in question are perfectly compatible, *provided that there are no omniscient beings*. Now, the author gives no grounds whatsoever for belief in the proposition that there are omniscient beings, and indeed

It is extremely improbable that there are beings which are omniscient in the sense that they possess every possible experience, or even every possible kind of experience, which are the only senses of "omniscient" that are relevant in this context. In addition to this inadequate argument on the basis of logic against the view that religion depends upon ignorance, several more satisfactory arguments to the same effect are urged on the basis of common sense, and it is shown that neither the rise and fall of creeds with the growth of knowledge nor the more intimate changes induced by the same cause in the religious emotions suffice to prove the statement that "ignorance is the *fons et origo* of the religious emotions," which Professor Keyser categorically states to be false.

Now comes the crucial point of the book: the statement, namely, that the rational implies and reveals the superrational," and that the universe is not exhausted by the domains of sense or reason, but contains a realm into which logic can not go." To support this, the author introduces an argument from a mathematical analogy—that of limit. He points out the fact that a sequence of terms, such as the sequence of inscribed regular polygons in some circle, taken in order of magnitude, may indicate as its limit a term—the circle—to which the members of the sequence approach as close as you please, though they never attain it. Another example he gives is that of the square root of two—this is not a rational number, but may be made the limit of a sequence of rational numbers. Professor Keyser claims that a domain of "objects or spiritual entities" may give us a clue to the nature of those entities outside it which are limits of sequences of entities contained in the domain, and he points out that the collection of these latter entities may be infinitely richer than the original domain in which lie the sequences of which they form the limits. In this manner, he claims, objects of reason, such as geometrical shapes, are limits of sequences of objects of sense, such as the forms that we see, and further, entities belonging to the superrational form the limits of sequences of objects belonging to the realm of the rational, while the realm of the superrational may still be richer than that of the rational. As examples of objects thus defined, the universe, considered as a class including, among other things, all classes as its members, is mentioned, and, on the other hand, such notions as that of omniscience.

In this whole discussion, the author's arguments are by no means adequate. One of the chief services of the modern mathematical logicians is to have pointed out that no entirely new realm can be discovered as the limiting realm of regions already given. For example, it has been shown by Cantor, Dedekind, and Weierstrass that one can not say that a sequence of rational numbers has an irrational limit until, by a method not involving the use of the notion, "limit," one has already obtained access to a domain including both the rational and the irrational numbers. All that the method of limits can do is to lead us from the more explored to the less explored parts of a region which is previously given as a whole; nothing on earth could justify us in saying that the sequence 1, 1.4, 1.41, 1.414, . . . has the limit $\sqrt{2}$, or, indeed, any limit whatsoever,

did we not already have the knowledge of a system including both the members of the sequence and $\sqrt{2}$. The method of limits can lead from one part to another of a single rational domain, but it certainly can not lead us from one rational region to another—much less from the rational to the superrational. The introduction of the notion of limits in the discussion of the relation of the rational to the superrational, though it may be a suggestive metaphor, should be nothing more than a metaphor.

Furthermore, the particular examples which the author chooses as illustrations of things superrational which are limits of sequences in the realm of the rational are unfortunate. He tries to show the superrationality of the universe in accordance with an argument given for a different purpose by Mr. Bertrand Russell, whose name is again accidentally omitted in this context. Mr. Russell's form of the argument deals with all classes that are not members of themselves—he shows that the class of all classes that are not members of themselves, if it is a member of itself, can not be a member of itself, while if it is not a member of itself, it may be a member of itself. From this, Mr. Russell draws the conclusion that it is illegitimate to speak of a class either as a member of itself, or not a member of itself, and that any "universe" to which one attributes classes which either are or are not members of themselves, does not merely fail to belong to the realm of the rational, but can not belong to any domain whatsoever—not even to that of the superrational. However, on the assumption that no class is a member of itself, in some perfectly legitimate sense, and that the universe is the class of all classes, after stating what is obviously intended to be Mr. Russell's argument in a form in which it is unnecessarily deprived of all its cogency, Professor Keyser comes to the conclusion that the universe is superrational, on the basis of this argument. He claims that the universe is the limit of a sequence of rational entities in that it is the limit of a sequence of classes that are amenable to the processes of logic, though he leaves utterly in the dark as to just what his sequence is. He argues on the basis of common sense against any claim which might be raised that the universe does not exist as a whole. This last point is the Achilles' heel of his argument. The tautologous truth that every existent thing exists is no justification whatever for the assertion of the proposition that there is some single aggregate which contains all existent things. Professor Keyser must know how little the first verdict of common sense is to be trusted in mathematics: why should he put more faith in it at this point where the common sense of the greatest living mathematicians has led them to diametrically opposite conclusions? Furthermore, there is no reason whatsoever that will bear the slightest examination which can furnish an adequate justification of our belief in the existence of a class of all classes.

After considering a number of supposed entities of the same general character as the class of all classes, which we have even less reason to consider superrational and existent than the latter, Professor Keyser comes to the notion of omniscience. He claims that not only is

etual possession of infinite knowledge beyond the reach of man, but even that the human intellect can not grasp the mere *idea* of a being who knows all, and therefore has neither the need nor the ability to acquire knowledge, to think. The author gives no argument whatever to show the existence of an omniscient being, and nowhere gives a precise definition of omniscience, so that his claim that omniscience is an example of a superrational entity, belonging to the boundary of the rational, is hardly established. Furthermore, there is nothing beyond the grasp of the human reason in the *idea* of a being who knows all, and therefore does not think nor need to think, or if there is, our author has not pointed it out.

After finally including absolute beauty and absolute love in the category of those things which are superrational, yet form limits to the world of the rational, Professor Keyser brings "Science and Religion" to a close. The book, notwithstanding its occasional technical inaccuracies, bears witness to an unusual breadth of interest and comprehensiveness of view of the author, and gives the non-mathematical reader a real insight into the relation between the scope of human knowledge and that wonderful realm of infinities which has been opened up by the modern mathematicians.

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Selections from the Scottish Philosophy of Common Sense. Edited with an Introduction. G. A. JOHNSTON. Chicago and London: The Open Court Publishing Company. 1915. Pp. 23 + 238.

This little book, as the title implies, contains selected source material, with an important critical introduction of 23 pages. Of the 238 pages of source material, 168 are devoted to Thomas Reid, 19 to Adam Ferguson, 3 to James Beattie, and 38 to Dugald Stewart.

The first and most important of the Scottish philosophers was Reid. Even Hume recognized the ability of Reid and the power of his criticism. The contemporaries and successors of Reid made little real contribution. Beattie, owing to his vulgar denunciations of the skepticism of Hume, enjoyed a greater popularity. The work of Ferguson betrays a "thinness and lack of originality." Stewart was a popularizer and did much to secure for the Scottish philosophy respect among other philosophers.

The Scottish philosophy of common sense is a protest leveled against the skepticism of Hume. Reid was the only man of his time who really understood Hume. It was he who discovered that the skepticism of Hume was the logical conclusion of Locke's premises. The criticism is really, therefore, directed against Locke. It is a criticism of Locke *via* Hume. This is the true meaning of Higher Criticism, it is higher in the sense of beginning higher up stream, nearer the sources. Locke's philosophy is worked out in terms of the mind-ideas-object scheme. Berkeley had denied the existence of the object, Hume that of the mind; it remained for Reid to deny the existence of Locke's third factor, namely, ideas. Locke's

"ideas," involving a representative theory of perception and a copy theory of knowledge, have, according to Reid, no real existence. By denying the existence of ideas in the Lockean sense of the word, Reid is enabled to refute the skepticism of Hume, the task constituting the object of his real interest. Thus Berkeley's denial of the object, Hume's denial of the mind, and Reid's denial of ideas involve the destruction of the whole apparatus of Locke's philosophy. Reid is thus enabled to begin the whole work afresh. His point of departure is not with hypotheses, as was the case with Locke, but with the principles of common sense. The philosophy of Reid is constructive as well as critical. The appeal to common sense, that is, the common and uniform principles of human nature, bears striking analogies to the critical philosophy of Kant. It differs, however, in that Kant's philosophy is epistemological whereas that of Reid, true to the British method, is psychological. Reid's critique of knowledge, like that of Kant, is opposed to sensationalism. Judgment as a synthetic operation of the mind precedes simple apprehension. Sensations are products of abstraction. Kant's criticism of Reid is based on a misunderstanding, and it is doubted whether Kant had any first hand knowledge of Reid. Reid's theory of knowledge involves a distinction between sensation and perception. Bare sensation never gives knowledge; all knowledge involves perception as an activity of the self, an ultimate principle of human nature.

M. T. McCLURE.

THE TULANE UNIVERSITY OF LOUISIANA.

JOURNALS AND NEW BOOKS

THE JOURNAL OF ABNORMAL PSYCHOLOGY. December 1915-January, 1916. *The Sex Worship and Symbolism of Primitive Races, II.* (pp. 297-314): SANGER BROWN. - The evidence of the worship of sex is found in the records and monuments of antiquity. Our knowledge of customs and practises of certain tribes indicates the presence of such worship. It is so general and widespread that it may be considered part of the evolution of the human mind. "There is abundant evidence to show that there was a time in the centuries before Christ when prostitution was held as a most sacred vocation." The worship of sex plays a very prominent part in the developing mind of man. "As civilization advanced, the deification of sex was no longer frank and open. It came to be carried out by means of symbolism." Certain philosophers adopted fire to represent the male principle, and water, the female. *The Psychoanalytic Treatment of Hystero-Epilepsy* (pp. 315-328): L. E. EMERSON. - Three cases of the borderline of hysteria and epilepsy are presented to study some of the problems of therapy from the psychoanalytic point of view. *On the Genesis and Meaning of Tics* (pp. 329-359): MEYER SOLOMAN. - The views of the Freudian school are reviewed and the evolutionary, phylogenetic standpoint, and the application of Adler's theory of the neurotic to tics are mentioned. "In the physical aspect of tics we have a specific somatic

manification which if explained should, in a way, be the gateway toward the understanding of the many somatic symptoms which we find in the psychoneuroses and psychoses." Psychology of animals, of children, of primitive races, gives opportunity for studying some somatic and psychic manifestations. The understanding and meaning of genesis of tics "opens the gateway to the elucidation of the origin and significance of the psychoneuroses and functional psychoses." *Reviews*: William Healy, *The Individual Delinquent*: JOHN T. MACCURDY. J. J. Putnam, *Human Motives*: L. P. CLARK. E. L. Thorndike, *Educational Psychology*, Vol. I.: E. B. HOLT. H. A. Bruce, *Sleep and Sleeplessness*: ISADOR H. CORIAT. *A Correction. Books received.*

Rockefeller, Jr., John D. The Colorado Industrial Plan. 1916. Pp. 95.

Stepanow, Giovanni. Sogni Indotti: Studio sperimentale sull'influenza degli stimoli acustice sul sogno. Firenze: Reprinted from *Psiche*. 1915. Pp. 59.

Stepanow, Giovanni. I Fatti storici e la loro realta. Prato: "La Tipografica." 1916. Pp. 28.

Tucker, Beverly R. Nervous Children. Boston: Richard G. Badger. 1916. Pp. 147. \$1.25.

Watson, John B. The Place of the Conditioned-Reflex in Psychology. Reprinted from the *Psychological Review*, Vol. XXIII., No. 2. Pp. 89-116.

Yerkes, Robert M. The Mental Life of Monkeys and Apes; A Study of Ideational Behavior. Behavior Monographs, Volume 3, Number 1. Cambridge: Henry Holt and Company. 1916. Pp. 145.

Yerkes, Robert M. Provision for the Study of Monkeys and Apes. Reprinted from *Science*, N.S., Vol. XLIII., No. 1103. Pp. 231-234.

NOTES AND NEWS

At the meeting of the Aristotelian Society, held on March 6, the president, H. Wildon Carr, in the chair, a paper was read by Professor T. Percy Nunn on "Sense-Data and the Physical Object." The writer criticized the view, held in different forms by Dr. J. E. Moore and Professor Stout, that physical objects are revealed in perception as existences of which we have immediate knowledge, that they are the "sources" of our sense-data. As against this view, he contended that the "source" is not an existence beyond the sense-data, but includes the whole collection of such sense-data as could be directly apprehended by perceiving subjects under different conditions. Nothing, he urged, is gained in "simplicity and naturalness" by invoking admittedly hypothetical "sources" in order to say about them something formally identical with what must in any case be said about indubitable sense-data. For instance, the assumption of

a "source" in order to explain why we attribute real shape to an object creates more embarrassment than it removes. For while it may account for the sense-data that resemble the alleged "source" in shape, it affords no help in accounting for those that do not. So again, the argument that sense-data carry with them a reference to a "source" breaks down when the attempt is made to deal with the problem of hallucination and error. Furthermore, the notion of a "material substratum of phenomena," used in physical science, does not really involve the assumption of a hypothetical "source." For the molecules (and atoms) of the physicist are simply the molar bodies of every-day experience conceptually reduced in size. Whatever belongs to the latter may belong to the former also. Physical speculation assumes complete continuity between the behavior of molar bodies and of the ultimate constituents of matter.

DR. PAUL SHOREY, professor of Greek in the University of Chicago, delivered the Norman W. Harris Lectures on May 1 to 6 at Northwestern University. The general title was "The Development of Ethical and Spiritual Religion in Greek Literature," the individual lectures being on the following subjects: (1) "Introduction," (2) "Religion and Greek Poetry," (3) "The Religion of Philosophy," (4) "Skepticism and the Spirit that Denies," (5) "The Gospel of Socrates," (6) "The Religion of Julian."

THE New York Branch of the American Psychological Association met in conjunction with the Section of Anthropology and Psychology of the New York Academy of Sciences on May 1 at Columbia University. The following papers were read: "Some Tests for Vocational Guidance," Mr. Herbert A. Rogers; "The Visibility of the Nerve Current," Mr. Christine Ladd-Franklin; "Taboos in China," Mr. T. T. Lew; "Hypnotism and Psychoanalysis Cures Neuroses," Dr. S. A. Tannenbaum.

PROFESSOR EDWIN L. HOLTON, director of the summer school of the Kansas State Agricultural College, will teach this summer at the Chicago University Summer School and will then take a year for graduate study at Teachers College. During his absence Professor Edward H. Reissner will act as director of the summer school and head of the department of education at the Kansas State Agricultural College.

PROFESSOR JOSEPH JASTROW, of the University of Wisconsin, addressed the Sigma Xi Society of the University of Indiana on March 28 on "The Expression of the Emotions," and delivered the Convocation address at that university on March 29 on "Theory and Practice." On March 29 he gave the Sigma Xi address at Purdue University on "The Sources of Human Nature."

THE Sixteenth Annual Meeting of the Western Philosophical Association was held at Washington University, St. Louis, Missouri, April 21 and 22. The sessions on the first day were devoted to a discussion of "The State."

AT Barnard College, Columbia University, Dr. H. L. Hollingworth has been advanced to the grade of associate professor of psychology.

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

ERNST MACH AND THE NEW EMPIRICISM¹

WITH the recent death of Professor Ernst Mach another prominent figure has passed from the field of philosophy. To us in America this event has perhaps an exceptional interest, for Mach was a pioneer in the movement which has resulted during the past two decades in so profound a change in our philosophical outlook and temper of mind. For those who rejoice in this change, Mach's career is that of a prophet preaching a gospel of empiricism to a generation corrupted by the philosophy of transcendentalism and a metaphysics that mistook itself for natural science. Whether we regard Mach as a prophet or simply as a physicist with a mischievous tendency towards speculation, at any rate, the reward of a prophet, in a mild degree, was his. For a long time the attitude towards Mach was the attitude which the world has always adopted towards those who wilfully and maliciously disturb the peace. Among philosophers Mach's status was more or less that of a *parvenu*, lacking in a proper sense of modesty and of reverence for sacred things. In the household of physics, where he had been reared, his views regarding the nature of the concepts underlying physical science were likewise regarded with suspicion. That the relations were somewhat strained appears from Mach's own utterance, as follows: "We can see that the physicists are on the surest road to becoming a church, and are already appropriating all the customary means to this end. To this I simply answer: 'If belief in the reality of atoms is so essential for you, I hereby abandon the physicist's manner of thought, . . . I will be no regular physicist, . . . I will renounce all scientific recognition; in short, the communion of the faithful I will decline with best thanks. For dearer to me is freedom of thought.'"²

Apparently Mach himself was somewhat uncertain as to his real status; at all events he repeatedly asserted that he was not a philosopher, although, during the later years of his life, he could not

¹ Read at the meeting of the Western Philosophical Association, St. Louis, April, 1916.

² Quoted from the *Monist*, Vol. 21, page 33.

well deny the soft impeachment of being a professor of philosophy. That the distinction is a significant one it would be folly to question, but Mach's reason for the distinction is, let us hope, more dubious than the distinction itself. He disclaims being a philosopher for the reason that philosophy commonly insists upon a distinction between appearance and reality, or between the phenomenal and the transcendental, a distinction to which Mach felt himself unable to subscribe. And since such labors as his were all too easily dismissed as "mere psychology" or else as just scientific methodology, he signifies his willingness to waive the point and once more forego the communion of the faithful by remaining identified with those who seek no reality beyond that which is revealed in the world of everyday experience. In spirit or temper this is the attitude which in this country has called itself radical or immediate empiricism. In Mach's own words: "I must say with Schuppe, 'The land of the transcendental is closed to me.' And if I add the open confession that its inhabitants do not arouse my curiosity at all, it will be possible to measure the gulf that exists between many philosophers and myself. I have therefore already declared expressly that I *am not a philosopher at all, but only a scientist*. If, nevertheless, I have sometimes been numbered with the former, in somewhat loose fashion, I can not hold myself responsible for this."³

When used with this invidious connotation the term philosophy comprises all attempts to give a systematic account of human experience in terms of non-experiential reals. To all such attempts Mach felt a constitutional aversion, and so he found himself quite as much out of sympathy with materialism and subjectivism as with transcendentalism. "I make no pretension to the title of philosopher. I only seek to adopt in physics a point of view that need not be changed the moment our glance is carried over into the domain of another science; for ultimately all must form one whole. The molecular physics of to-day certainly does not meet this requirement."⁴ Again he says: "There is no conceivable possibility by which the customary elements of present-day physics, viz., mass and motions, taken in all the rigidity which is requisite for the special sciences, could account for any sort of psychical occurrence. But Mach is no less explicit in his rejection of subjectivism.⁵ I conceive of sensations as entirely different from physical objects simply to choose the other alternative of a false dualism. And

³ "Erkenntnis und Irrtum," Preface. (The references are to the second German edition.)

⁴ "Analysis of the Sensations," English translation by Williams. P. 23, note.

⁵ "Erk. u. Irrtum," page 12, note.

⁶ Cf. "Erk. u. Irrtum," Chap. I., and "Analysis," Chap. I.

attempt a reconciliation of these two abstractions by means of a thing-in-itself or some other form of "metaphysical deviltry" is to make the confusion worse confounded. All such attempts mean a crossing of the boundary line beyond which "looms but the horror of the shade." "For me," he says, "every scientific labor which does not *hold fast* to the immediately given and which, instead of determining the *relations* of the characters of the given, goes off fishing somewhere in a vacuum, is labor lost."

Such a programme as Mach proposes involves an extensive modification of customary views. If the purpose of scientific inquiry be restricted to the investigation of the relations that obtain among our various experiences, the purpose and value of such inquiry must be simply to enable us to make use of a given experience as a clue to other experiences. Starting with a given experience, the scientific law makes it possible for us to fill in the rest of the picture without being obliged to resort to direct experience in order to find out the meaning or value of what is given. "It is the object of science to replace or *save* experiences by the reproduction and anticipation of facts in thought."⁸ "In nature there is no *law* of refraction, only different cases of refraction. The law of refraction is a concise, compendious rule, devised by us for the mental reconstruction of a fact, and only for its reconstruction in part, that is, on its geometrical side."⁹ "There is every reason for distinguishing sharply between our theoretical conceptions of phenomena and that which we observe. The former must be regarded as merely auxiliary instruments which have been created for a *definite* purpose and which possess permanent value only with respect to that purpose." They "must be regarded as mere helps or expedients to facilitate our consideration of things."¹⁰

The same interpretation, we find, applies to the concepts of the physical and psychical, which have played so ominous a rôle in the history of thought. Mach warns us that in the study of the physical and psychical "we must not allow ourselves to be impeded by such intellectual abridgments and delimitations as body, ego, matter, mind, etc., which have been formed for special, practical purposes and with wholly provisional and limited ends in view."¹¹ The physical and the psychical, in short, are just names for certain types of relationship between the given and other facts. The immediately given consists of certain elements, such as colors, sounds, tastes, and smells. These elements are not produced by material

⁷ "Erk. u. Irrtum," page 13, note.

⁸ "Science of Mechanics," Eng. transl. by McCormack, page 481.

⁹ *Ibid.*, pages 485, 486.

¹⁰ "Analysis," pages 186, 187.

¹¹ *Ibid.*, pages 23, 24.

objects; they make up material objects. When we investigate given experience, we find that it consists of elements variously related or conditioned. There are no isolated or detached elements. In so far as this conditioning takes place outside the body, these elements are physical; in so far as the elements are conditioned by the body of the observer, they are mental or psychic. "A color is a physical object so long as we consider its dependence upon its luminous source, upon other colors, upon heat, upon space, and so forth. Regarding, however, its dependence upon the retina, it becomes a psychological object, a sensation. Not the subject, but the direction of our investigation, is different in the two domains."¹²

So far Mach's point of view is commendably clear and definite. The element or sensation is the final reality. The element itself cannot be explained. Mach argues, "we should not try to explain. It is something so simple and fundamental that its reduction to something more simple can not succeed, at least for the present. The single sensation is neither conscious nor unconscious. It becomes conscious through interrelation with the occurrences of the present."¹³ The interrelation by virtue of which the sensation becomes conscious is, of course, the relation to the body, as indicated a moment ago. It is when we inquire further into the relations of the elements that the fog begins to settle down and both the element and its relations are lost to sight.

As may be anticipated, the clearness of Mach's doctrine springs from an oversimplification of the facts. The relations maintained by a given element to the body and to other elements outside the body are more complicated and confusing than appears at first sight. To consider first the extra-bodily relations of the element, a study of these relations soon reveals the fact that the quality with which we start is not an element at all, but a compound. As Mach himself points out, primitive man, like the lower animals, "probably takes the objects of the environment as wholes, the contributions which are made by the different senses, but which are given to him only in conjunction, not being separated out."¹⁴ Form and color are not distinguished, and still less is a blending of colors reduced to its elements. The analysis of experience into elements is a progressive affair; the analysis, for example, of noises into simple tones is an achievement of modern science; and, in general, it can scarcely be denied that the possibilities of analysis extend beyond any definitely assignable limit. Our elements, therefore, turn out to be, Mach himself recognizes, merely provisional elements, and the h

¹² *Ibid.*, pages 14, 15.

¹³ "Erk. u. Irrtum," page 44.

¹⁴ *Ibid.*, page 12, note.

pothesis that there are final and irreducible elements becomes—at least for an avowed empiricist—a gratuitous assumption.

This result, perhaps, constitutes no great cause for alarm. If, however, we now turn to the relation of the given to the perceiving organism, the situation becomes more serious. The visual object, we find, is related not only to the retina, but to the various neural processes induced by the optical stimulus. All this is clear enough, but Mach is aware that it is not sufficient, after all, to trace out the bodily facts or conditions to which the experiential object is related in the conscious situation. It is also necessary to ascertain what sort of a change it is that takes place when consciousness arises. Is it sufficient to say that the mere addition of a neural process to something else is the change which constitutes the consciousness or awareness of what is given? In some connections Mach seems to hold this view. "Consciousness," as he says on one occasion, "is precisely a specific, important interrelationship of the parts of the brain."¹⁵ But this is plain materialism and does not represent Mach's more habitual point of view. The transition to another standpoint is accomplished by the substitution of certain other elements for the neural process in question. These elements are not identical with the neural process, but stand to this process in a relation of independence. Consciousness is just a certain organization of elements, and the elements which must add themselves to what is already present are those which depend upon the processes of memory and association. When a nervous system has once undergone certain modifications, subsequent stimulations normally arouse or revive certain copies or images of the previous occurrence. These images are likewise elements, differing only in degree from those of a sensory kind. They blend with the sensory contents or elements and provide them with a context; and it is only when this happens that consciousness is present. "Consciousness is no specific (psychic) quality or class of qualities, which distinguishes itself from physical qualities; neither is it a specific quality that must add itself to the physical in order to transform the unconscious into the conscious. Both introspection and the observation of living beings to which we are obliged to ascribe consciousness analogous to our own, teach us that the height of consciousness varies with the richness, the ease, rapidity, vivacity, and orderliness of these functions. Consciousness does not consist in a specific quality, but in a *specific connection* of given qualities."¹⁶

The import of this doctrine is that when we approach the given from the side of the body, the "element" once more eludes our grasp. The given which is related to the body is not an element,

¹⁵ *Ibid.*, page 109.

¹⁶ *Ibid.*, pages 43, 44.

but represents a blending of a sensory content with various images or revived impressions. "The city hall which I pass," says Mach "would be for me merely a spatial arrangement of colored spots if I had not already seen many buildings, walked through their passages, and mounted their stairs. Recollections of manifold impressions become interwoven with the optical sensation so as to constitute a much more richly endowed complex, the observation, from which we separate the merely momentary sensation only with difficulty."¹⁷ If, however, our perceptions of ordinary sense-qualities are inevitably interwoven with revived impressions, and if these revived impressions, in turn, are the outcome of previous blendings, the attempt to analyze out ultimate constituents or elements is suspiciously like the quest for the pot of gold at the foot of the rainbow. We escape materialism only to fall into the pit of "mental chemistry." These constituents never enter human experience at all, and an explanation of experience in terms of them is, in principle, the same sort of thing as an explanation in terms of masses and motions or of transcendental realities. In other words, Mach himself commits the unpardonable methodological sin—a result which indicates that correct empirical procedure requires considerably more than a pious resolution to have no dealings with unknowables.

Does this result warrant the inference that the empirical method has failed? By no means. There is good ground for the view that the undertaking has miscarried just because the empirical method was not maintained throughout. In the interpretation of concepts and laws Mach takes his clue from adaptation and so remains on the empirical level; but in the interpretation of sensory experience he abandons this method and explains such experience and the changes effected in it as a result of the process of analysis by taking appeal to certain groupings or blendings of non-empirical "elements." This is plainly a failure to "hold fast to the immediately given" and surrender to the temptation to find solutions for our problems in the "airy nothings" of words.

The point that I wish to emphasize is that the spirit of Mach's own method requires an interpretation of the changes wrought by analysis in terms of specific and ascertainable conditions, and not in terms of inaccessible "elements." The suggestion lies at hand that, since concepts are to be regarded as "mere helps or expedients to facilitate our consideration of things," so the analysis of an object into various qualities or attributes may be just a device for the facilitation of our adaptation to it. Or, more generally, the nature of consciousness is to be sought, not in an inscrutable organization of elements or qualities, but in a certain transformation of objects

¹⁷ *Ibid.*, page 21. Cf. also page 36.

the interests of adaptive behavior. As Mach points out, in ordinary reflexes stimulus and response are immediately associated; and consciousness supervenes only when the mechanical stimulus has become inadequate. "When the simple stimulus, owing to complication of the conditions of life, becomes too ambiguous to determine behavior of an adaptive kind, the sensation appears as an independent element, which, together with recollections and images, determines the condition of the organism, the affective mood, and thus finally sets free activity having a conscious end."¹⁸ The "ambiguity" of the stimulus means that a variety of conflicting responses are brought into play, so that a deadlock ensues, which can be ended only by the advent of a new stimulus. If we read off the hypothetical fusion of recollections and images with the sensory content as a transformation of the stimulus, the way is open for a consistent application of empirical method all along the line.

The importance of this topic for empirical method must be my apology for venturing upon a brief excursion in this direction. As Mach intimates, the effect of past experiences is to provide the present situation with a conscious end or goal. The result that is still to be attained somehow comes in to give direction to present conduct. The problem of consciousness, then, is the problem of explaining how a future result or consequence can operate so as to determine present conduct. Concerning the fact itself there is scarcely room for dispute. A plant, for example, will respond to rain, *after* the rain has come, by putting forth new shoots and leaves; but an intelligent being will respond to the rain *before* the rain has arrived, by seeking shelter or by hurriedly sowing grass seed on the barren patches of the lawn. The rain which is still to come, which is not yet a present fact at all, gives direction to conduct. But how is this possible? How can a non-existent future control the affairs of the present? It is plain that the future must somehow get into the present in order to become effective for conduct; and this transfer of the future into the present is precisely what is meant by consciousness.

At first sight this anticipation of the future is likely to have an appearance of mystery similar to that of prophecy. The facts of bodily behavior, however, indicate that this anticipation has a physical basis. That the human nervous system has an extraordinary capacity for receiving and retaining modifications is a familiar fact. If a person has once been burned by a fire, the response that is set up by the optical stimulation originating from fire is likely to be different ever after. The body will tend to repeat the movements of withdrawal that were originally caused by the burn, *i. e.*, the body

¹⁸ *Ibid.*, pages 108, 109.

engages in defensive movements before the burn occurs. Speaking metaphorically, the bodily movements anticipate a stimulus, viz., burn, which has not yet arrived. Similarly, if a hungry person sees a tempting morsel, his mouth waters and his jaw tends to move at the same time that his hand goes out towards the food. These actions originally occurred in succession, but now they are set off simultaneously. The nervous system has acquired a certain set or mode of behavior, so that the entire little episode is acted out beforehand in a miniature way. The object is being grasped and eaten before it is even touched. Here again the bodily movements "anticipate" stimuli that still lie in the future.

These facts acquire significance for the theory of consciousness if we relate them to the view that consciousness arises in response to a biological need. As long as our responses work smoothly, behavior remains on the plane of reflex activity. But let a physical stimulus evoke a number of incompatible responses—or, in Mach's phrase, let a stimulus become ambiguous—and a crisis sets in. The responses oppose or collide with one another, and instead of adaptive behavior the result is a state of tension or inhibition; and the only way to secure adaptive behavior is to secure a stimulus that is able to effect such an organization of these conflicting activities as will further the interests or needs of the organism.

To acquire such a stimulus and to be conscious are one and the same thing. The conscious stimulus is of a unique kind, and this unique character is determined by the responses which are still inhibited and struggling for expression. More specifically, the character of this new stimulus is determined by the adaptive value of the nascent activities. The incipient response to "burn" or "hot," for example, is a response which, if it were to attain full-blown completion, would be a maladaptation. This nascent response is the echo of a response which came as a convulsive shock and which disorganized the vital processes of the body. On the other hand, the response to food is a response which, if carried out, would have adaptive value, since it expresses the biological need of nutrition. The suppressed responses would be good or bad, *if they were completed*, and the change that is wrought in the stimulus is a change that makes it a stimulus for the realization of the adaptive values which are thus foreshadowed or anticipated. To say that the fire looks hot is to say that the fire is a stimulus which controls the organism so as to avoid the maladaptation of being burned; to see an object as "good to eat" is to have a stimulus that promotes the interests of the organism by inducing the activities appropriate to eating. The distinctive character of the conscious stimulus is this control by future consequences; and consciousness, accordingly, is just a name for this control of behavior by future consequences or results.

It is hardly necessary, perhaps, to add that these stimuli are subject to development concomitantly with the development of the nervous system. The range of variation is all the way from a stimulus presented in early infancy and describable only as "exciting" to the highly differentiated and complicated environment of the civilized adult. From this standpoint the differentiation or the analysis of objects or qualities necessarily has reference throughout to behavior. Adaptation is the standard, not only in the interpretation of concepts, to which this standard was applied by Mach, but in the interpretation of every form of experience. Unless the interpretation be made thoroughgoing, the concept and the given fall apart; meanings do not grow out of experience, but become mere guesswork, random and arbitrary attempts at reconstruction, without a proper criterion or motivation. The elaboration of this interpretation does not come within the scope of the present discussion. Whatever its merits, it may serve to point out, in a general way, the implications of the empirical method for which Mach stood sponsor. As was suggested previously, it was precisely in connection with the problem of consciousness (or of analysis) that Mach's instinct for the concrete deserted him and permitted him to take refuge in the doctrine of irreducible elements. Hence the peculiarity of consciousness as behavior determined by future results escapes his notice and leaves him wavering between materialism and atomistic subjectivism. Neither of these alternatives is capable of treating human conduct as other than a complicated form of mechanism,¹⁹ or of bringing its explanation of experience out of the darkness of metaphysical abstraction into the light of common day.

As judged by the requirements of empirical method, Mach's work undeniably has many shortcomings. Yet the success or failure of this method in his hands is, in a sense, a matter of minor importance. Of far greater moment is the spirit or attitude which he helped to create. If we measure Mach's achievement, as is proper, by what he did to make clear the task or function of philosophy, his work entitles him to a permanent place in the record of human progress. For Mach the empirical method meant ultimately that philosophy must justify itself, not as an intellectual pastime or as an emotional indulgence, nor yet as an escape from the unwelcome realities of our present existence, but by its bearing on human weal and woe. All knowledge is, for Mach, "a psychical occurrence which either immediately, or at any rate mediately, promotes biological adaptation."²⁰ Fundamentally the appeal to concrete experience is an insistence that philosophy is under obligation to furnish an insight into the relation of the individual to his world which will

¹⁹ Cf. "Erk. u. Irrtum," chapter on "Reflex, Instinct, Will, Ego."

²⁰ *Ibid.*, page 115.

be of service in the attainment of specific ends and values. A philosophy that ignores the needs and demands for better adaptation of our human life, here and now, forfeits its claim to consideration. On the other hand, the hope of better adaptation furnishes a constant incentive and inspiration. This *motif* stands out in the closing sentences of "*Erkenntnis und Irrtum*," where Mach says: "If we reflect on the agonies that our ancestors had to endure under the brutality of their social institutions, their legal systems and courts of justice, their superstitions and their fanaticisms, if we consider the rich heritage of the present in these goods, if we imagine what we shall possess of these goods in our descendants, we find in all this a sufficiently powerful incentive to cooperate, zealously and vigorously, with the help of our psychological and sociological insight, for the realization of an ideal moral world-order. And when we have once created such a moral order, no one will then be able to say that it does *not* exist in the world, and no one will have the need to seek for it in mystical heights or depths."

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TWO RATIONAL MORALISTS

TWO American scholars, from two different points of view, have lately revived the old doctrine that virtue is knowledge. What a change of tone from the pragmatism and instinct-worship of these recent years! It would be interesting if the present war should mark the end of that romantic infatuation which for a century has been glorifying will, work, struggle, contradiction, and instability, without any idea or hope of an ultimate good. At a moment when the dreadful corollaries of this heathenism have turned the earth more than ever into a hell, it would be some compensation to recover the true though unrealizable ideals of the race, and again to believe in harmony, in intelligence, in perfection, and perhaps even in heaven.

Professor John Erskine has collected four addresses under the title, "The Moral Obligation to be Intelligent."¹ In them he represents intelligence as both the means and the end of true progress. Affection, he says in effect, is partiality, it is a sort of animal loyalty, while intelligence is the same as universal sympathy. It unites men separated by material interests and passions; it is the one stimulus to justice. It is also the ultimate good to which our nature is addressed. We hear a great deal of the duty of service, but service should not consist in degrading the lives of the best men by subordinating them to the aims of vulgar natures. Rather, by force of example and co-

¹ New York. Duffield & Co. 1915.

tagion, the best men should raise the others as far as possible to an intellectual life. "True service," Mr. Erskine writes (p. 68), "lessens nothing. Not that the teacher should waste himself in the enterprises of boyhood, but that even boys should fall in love with the enterprise of truth; not that the scientist should become a commodity-monger, but that all men should enjoy the high commodity of the scientific spirit; not that the priest should be secularized, but that by a race-wide consecration man should become a nation of priests—this is the end of true service."

Even in literature, where his studies lie, Mr. Erskine judges rationally, with a view to what is humanly and spiritually best. Inspiration in the poet is a spontaneous gift not to be secured by any effort of art or reason, but art and reason are the surer possession, and they alone can serve to distinguish good inspiration from bad,—for vain or absurd inspiration is commoner than that inspiration which is a short cut to essential truth, a miraculous synthesis or symbol of the rational. Here we see another error of the recent past corrected—the notion that the esthetic realm is absolute and sacrosanct and that there a man must reduce himself to an abstract sensorium, without intellect, conscience, or a right to be deafened, bored, or disgusted. A work that is merely esthetic is indeed esthetic, but that grammatical assignation of it to its class is no title of honor. The esthetic may not be worth looking at, and the man who in certain instances thinks it worth looking at may not deserve to be alive.

That virtue is knowledge is also the conclusion arrived at by Professor E. B. Holt in his book on "The Freudian Wish";² but here, of course, the apparatus of the argument is far more elaborate. I will, however, pass over all those parts of this most interesting book which do not bear directly on the Socratic maxim in question. Incidentally Mr. Holt corroborates what we have just heard from Mr. Erskine. "We hear everywhere," he says (p. 149), "of bringing this and that good thing down to the unfortunate and the debased, and then of '*adapting*' it to the taste and comprehension of these same unfortunate and debased. . . . It seems to me a palpable fact that every form of philanthropy and 'social service' to-day is more or less infected with this fallacy. The idea is everywhere to bring the good *down* in the false hope that it will somehow lift the masses up. But why shall anything strive upwards, when all that is high is bidden to descend? And why is it not a striking and ominous fact that to-day the word '*aspire*' is never heard?"

The unit in the psychology of Freud is the "wish," the exact definition of which is "a *course of action* which some mechanism of the body is *set* to carry out, whether it actually does so or does not"

² New York. Henry Holt & Co. 1915.

(pp. 3-4). It is evident that this is not properly a "wish"; it is rather an impulse, a disposition, a propensity, or what before the days of psychology everybody with perfect propriety called a passion of the soul—one of those passions which were the elements of life. In these impulses we have the stuff of morals. Every one of them, as Aristotle says at the beginning of his "Ethics," has an end and this end (which may be itself an activity) is a good. If the seething enterprises were either isolated or harmonious, moral life would be plain sailing; we should have nothing to do but to follow our impulses and enjoy the goods that our nature, which they constitute, is capable of enjoying. But unfortunately they conflict both within each animal and between one animal and another. When conflicting impulses are at work in the same body they give rise to the problems of personal morality, and to those painful and disastrous suppressions of impulse which Freud has studied.

These suppressions, as distinguished from a rational discipline that should make for harmony, are the work of chance, of a bad education, or of moral taboos. Nevertheless, suppression in some form is inevitable—*entbehren sollst du, sollst entbehren*—since it is physically impossible to actualize all these warm potentialities at once and it is fatal to actualize them alternately, because when indulged they leave behind deepening and incompatible habits which tear the personality and the conscience to pieces. There is indeed a successive maturation in some of these impulses which allows a man who has himself well in hand, and can slough off incidental habits, to give free play to each passion in its season. This is something which supermen like Alcibiades, Cæsar Borgia, and Goethe have perhaps managed better than the conventionally virtuous; but it is a delicate business. Mr. Holt, who in this book proves himself a stern and redoubtable moralist, naturally looks for some strict solution and finds it in *discrimination*. You should carry out your natural impulses, but discriminating in each what is capable of cooperating with the others from what is irreconcilable with them. They should all live in one another's light, so that their too free operation, or a forced suppression of the minority, may not destroy personal integrity.

It is this light, it is complete knowledge, that alone can save the situation. If a man knows himself he can not go wrong morally. For his impulses (taboos being discarded) are all equally innocent and legitimate; but they are differently wise in view of the soul and the society of impulses they are born in. Give the man pause, enlighten him concerning his entire self, and his impulses will be automatically checked and marshaled in the one possible harmony. The only difference in virtue is a difference in wisdom. In this wisdom

conscience is evidently embodied, for the conscience is either one of the impulses harmonized, or a group of them, or the very tendency to synthesis which triumphs in wisdom. Morality in the narrower and personal sense is therefore well accounted for by this theory. A man who was wise after this fashion could find nothing to condemn in himself: the economy of his soul would be perfect.

It was perhaps for this reason that Socrates and Plato embraced this doctrine. They were political philosophers by tradition, being Greeks, but private moralists by vocation, and it is only to private morality that their system really applies. In the "Republic" the problem is how to save the soul, and the political discussion is introduced only as a great parable, because the public in those pre-Christian days had a keener sense for political than for spiritual perfection. What enabled Socrates and Plato to apply their personal morality in the gross, and to imagine that they had a political system as well as a spiritual one, was a triple oversight on their part. In the first place they thought that scientific knowledge of nature was impossible, or at least irrelevant to the government of life and to the right choice of ideals. In the next place, unlike the Indians, they overlooked the whole non-human creation. Finally they assumed that human nature was single, definite, and invariable. If appearance, tradition, and religious faith enlightened us sufficiently about the universe, if no beings counted except the human, and all human beings were essentially identical with ourselves, then, indeed, the morality of the single soul would cover all public morality: all men, to be good, would need to follow the same precepts, and if all men were good, society would be perfect.

Most of us now see quite clearly how far this is from being the case. The living world is fluid and contradictory, and to assume the uniformity of human nature and the adequacy of private virtue to secure public good opens the door wide to tyranny and to political apathy. The orthodox then profess to know man better *a priori* than he knows himself by experience; everything that departs from their conventions is set down for a disease, a sin, or a contradiction; and this innate obliquity in man their zeal must hasten to extirpate. No attempt to do justice to life or society is possible on such a basis.

Mr. Holt instinctively avoids these Socratic prejudices: that is the advantage of being modern and scientific, not too humanistic and not too theological. But I am not sure how in their absence he is to meet the difficulty of integrating those potential courses of action which are not seated in any single animal body. Who is to discriminate among them? By what standard is the relative force and value of each to be measured? If this difficulty can be easily overlooked, it is only because in ordinary cases we assume a tacit

governing impulse, with reference to which the others are pruned. Mr. Holt gives this elementary instance: a person impelled to eat mushrooms, but not knowing whether those before him are edible or poisonous, hesitates and fumbles, misses a good chance or runs a foolish risk, all for not knowing the exact marks of the poisonous variety. Give him this botanical knowledge and his course is clear and free, no temptation to taste the bad sort, no qualms in enjoying the good. But this solution is possible only because that person is decisively and superabundantly impelled to live. On this massive root the knowledge is grafted which helps him to accept or reject easily his minor desires. Enlarge the mushroom into a kingdom, a great reputation, a religion, or a lady-love, and the proof that it is poisonous decides nothing. The impulse to live has now a dangerous rival, and the man may say: Better this sweet poison and death than life without this sweetness. Can knowledge of itself harmonize *ultimate* impulses? Can it pronounce on the relative importance of different souls?

Let us suppose that in conformity with Mr. Holt's theory knowledge is merely a physical response, and further that it could be possible for some one creature to know and respond to the impulses of all others; this response and therefore this knowledge would evidently be a process in that particular creature. The response would seldom resemble and never coincide with its object; it would always remain a dog's response or a man's response, and the response of this particular man or dog at this particular moment. The alien impulses responded to would not be synthesized, but only the responses they provoked in one special creature under special circumstances. What would govern "discrimination" would be the vital equilibrium and total movement of this dog or man, not any comparable absolute weight of the alien impulses as they exist outside. Mr. Holt wishes to abolish subjectivity in psychology, the subjectivity of ideas, but he seems to be all the more plainly committed to a physiological subjectivity in morals. Knowledge and virtues which are the bodily response itself, need not be sympathetic; to understand need not be to forgive; on the contrary, it may be to hate more impetuously, whole-heartedly, and deliberately than ever. The only principle of social morality, on this theory, would seem to be a savagely systematic egotism.

I do not say this as condemning Mr. Holt's theory; at bottom I think every animal must be egotistical, in the sense that it must determine organically the limits and intensity of its sympathies. If we go so far as to maintain that only sympathy or good-will is a moral motive, that contention simply proves that the sympathetic impulse in us, at least ideally, has overwhelmed the no less virtuous

impulse to call some preferences vile and wicked. Knowledge, however, which is not the substance of the human soul, but a sort of celestial guest that may visit it, knowledge is really sympathetic, even when the ultimate response of the soul to the thing known is hostile; because, as I venture to think, it is not our ultimate or total response that is the ground of knowledge; the ground or organ of knowledge is a preliminary or included or residual movement, as of a fly-wheel, wherein our system reproduces, as well as it can, the movement of the object; and this imitative reaction is at once enlightening and sympathetic. But its function in our total animal life is merely to be a signal or, if we turn contemplative, to be a by-path and a sanctuary of peace. Our total response is animal, practical, egotistical, and in it our sympathy and knowledge are submerged. Macbeth feels for a moment how peacefully Duncan is sleeping, but his total egotistical response soon drowns that feeling, and he murders him.

Accordingly the knowledge requisite for "discrimination" is only one half of what is usually called virtue—hence the paradoxical character of the assertion that virtue is knowledge. The other half is a relative goodness, dependent on the degree of cooperation proper to various souls. The first part of virtue is integrity and this second part is beneficence. Beneficence is not knowledge; it must issue from a preestablished harmony; no amount of knowledge and Platonic sympathy, integrated in the soul of the cobra or the mosquito, could render them beneficent to man. And man in his turn, with increased knowledge, will only go more systematically to work to exterminate *them*. His intelligence, or their inability to express their principles in words, may prevent him from calling them wicked; his total impulse must always call them odious. Both parties, in their mutual malevolence, will be pursuing an ultimate harmony, but harmony may be established in many ways. You may make a desert and call it peace, or give everybody half a loaf and call it justice. It will always be only such justice and such harmony as your own integrated impulses demand. Your virtue will be beneficent only in so far as your nature is "good," that is, fundamentally harmonious with such other natures as it affects. Thus we see that the essence of political virtue is not knowledge, but humanity. Beneficence is not obtainable by rational discrimination among the impulses of each soul; it presupposes a natural cooperation among all the souls concerned. This harmony must preexist; for nothing would be more malevolent than the attempt to establish it artificially. That attempt is war.

When a rational morality finds itself face to face with this great field of irrepressible conflicts, in which it is impotent, it has generally taken refuge in retrenchment. Among the ancients knowledge came

to be prized for a new reason: not that it integrated natural life, but that it offered an escape from the vexation and maleficence inseparable from natural life. If we regard our animal career and the integration of its impulses as a vain and bitter good, which will never liberate us from egotism and from an almost universal cruelty, then we may see in our incidental capacity to know and to love the straight and narrow path of salvation. We shall not save our whole soul, but we may decamp, as it were, from the infected parts of it into the corner where goodness and understanding can really live. I need hardly say that this is not the spirit of Mr. Holt's ethics; but I do not think he has altogether appreciated the difficulty of transferring his principle of "discrimination" from an organic body into the world at large.

GEORGE SANTAYANA.

SOCIETIES

NEW YORK BRANCH OF THE AMERICAN PSYCHOLOGICAL ASSOCIATION

THE New York Branch of the American Psychological Association met in conjunction with the Section of Anthropology and Psychology of the New York Academy of Sciences, on Monday evening, February 28, at Columbia University. The following papers were read and discussed:

Tests of Mechanical Ability. J. L. STENQUIST.

The report consisted chiefly of a description and exhibition of a series of mechanical tests which have been devised by the author under the direction of Professor Thorndike. The first of these is called Construction Test, Series I, and is described in detail in "The Intellectual Status of Children who are Public Charges," *Archive of Psychology*, No. 33, Columbia University. Construction Test, Series II, is similar to Series I, but more difficult. These tests consist of a series of mechanical models to be assembled under standardized conditions by the subject, the original idea being to provide a test that did not depend upon the subject's ability to read and write, and to deal with heard words. In the case of Construction Test, Series I, age-grade standards have been built up and the child can be scored as over or under a standard "Construction-age," as determined by the scores of four hundred and thirty-two public school children of New York City.

The second type of test reported upon has been named "Recognition of Mechanical Devices" and consists of fifty-five mechanical devices, ranging from a common nail to a spark plug and its parts, all numbered and fastened to a card about 8 by 18 inches, placed in

a suitable box. A complete list of the names of all the devices is given the subject and his task consists in identifying each device known to him, which he does by writing the appropriate number before each name.

Both of these tests have only been begun and the data thus far gathered do not warrant any further conclusions, than those reported in the monograph referred to above.

Tests of the Memory of School Children. EDITH F. MULHALL.

An attempt was made to determine whether or not there are any characteristic differences between the two memory processes known as recall or reproduction and recognition. Answers were sought to the five following questions: (1) Does the person who recalls one kind of material well also recall another kind of material well; or what is the correlation between the recall of different materials? (2) Does the person who recognizes one material well also recognize another kind well; or what is the correlation between the recognition of different materials? (3) Does the person who recalls one material well recognize that material well; or what is the correlation between the recall and recognition of the same material? (4) Are the recall records of girls better than those of boys as earlier literature stated? Is there any sex difference in recognition memory? (5) Is there any difference in the sex variability in recall or in recognition?

The subjects were 192 children, 71 in 5B, 62 in 6A, and 59 in 6B, in a city school. The materials used were two series each of 25 words, 25 forms, 25 syllables. Memory was tested half of the time by requiring the subjects to write down what they remembered (reproduction) and half of the time by asking them to select from another set the items which they had and had not seen (recognition).

The conclusions were: (1) A person who can reproduce a great many items of one material can not necessarily reproduce many of another material. (2) The person who can recognize one material well can not necessarily recognize another material well. (3) A person who secures a high score for recalling words, forms, syllables may not necessarily receive a high score for recognizing words, forms, syllables, respectively. (In no case was the average of the coefficients of correlation as high as .30.) (4) One finds no superiority of the girls over the boys for recall, but a confirmation of the work of Chamberlain. There are no sex differences for recognition. (5) There is no consistent difference in sex variability in recall or in recognition.

Association and Classification.—G. C. MYERS.

The purpose of this study is to investigate the natural tendency of classification as shown by the superior speed in naming (within

certain limits) successive individuals of a single class, over the speed of naming single individuals of successive classes.

In the preliminary test each of 71 normal-school girls was supplied with a copy of 2 series, each of 10 class names of familiar things (Group I.). These two series interchanged reappeared on the opposite side of the page (Group II.). About half the subjects were given 18 seconds to write the names of things falling under each of the 10 class names of the first series. Then for the second series they were given a total of 180 seconds to write successively under each of the 10 class names, one name at a time, as many individual names as possible. For the other half of the subjects the procedure throughout was reversed.

The successive associations under single class names may be called *less controlled*, the others *more controlled* associates. In the 3 minutes the average total number of words given for group I as *less controlled* associates, is 56.4, M.V. 5.8, with a range of from 34-86 words. For *more controlled* associates the respective figures are 46.1, 4.9, and 20-60. For group II. the *less controlled* associates give 60.4, M.V. 6.5, and a range of from 39-77 words; the *more controlled*, 42.5, 4.0, and 32-58 respectively. This test is unfair to the *less controlled* records because of the time lost in writing.

In a second experiment on 56 girls the subjects were divided into pairs, each member of the pair serving as subject and experimenter in turn.

The writer read 20 class names pausing 8 seconds for each name while number one of each pair named as many individuals of the class as possible. Number two recorded the number of individual names given. Then number one was provided with a list of these 20 class names and on signal she named an individual of each class name, repeating the operation until interrupted by the writer at the end of 2 min. 40 sec. Number two recorded the number of responses as before. Then number two proceeded in reverse order with number one as recorder.

In the 2 min. 40 sec. the average total number of individual names given is, for *less controlled* associates 123.7, M.V. 13.8, range 89-182; *more controlled* associates 66.9, M.V. 9.7 and 53-106. Four subjects studied practise effect by repeating the test 9 times, over a period of several days. Three found an increase in the total number of associates of each type and the superiority of the *less controlled* associates increased with time. For the other subject both decreased with time.

These facts emphasize a fundamental difference between the two types of associates and the rather obvious inference that classification is a very natural process. The study is still in progress.

Test of Manual Accuracy of Pre-vocational School Boys.—RUSSEL L. GOULD.

The tests were undertaken for the purpose of offering some possible data on the efficacy of the newly established Ettinger Pre-vocational schools of New York City, in improving the general manual accuracy of the boys. The problem resolved itself into a new aspect of the old question of transfer from practised abilities to unpractised ones.

The plan was to test at the beginning of the school-year two groups of boys; one group of those just beginning the pre-vocational shop work, and the other a control group of academic boys of the same grade and school. At the end of the year the tests are to be repeated. In so far as they are a reliable index of general motor ability, they are expected to indicate some effect of the shop work.

The necessity for large groups and for moderate haste prevented the use of more than three tests on each boy. Those used were the thrusting, the hammering, and the common 3-hole test. The first two were designed for this work.

The thrusting test required a full arm movement; to hit with a pencil the middle target of a row of three varying targets, thirty rows appearing from behind a screen at a constant speed. Four groups of thirty were used, at four speeds, such that each row was in sight for 1.0 sec., 1.2 sec., 1.6 sec., and 2.0 sec. Each hit was separate and distinct, as one row only was in sight at a time. The number of hits ranged from 0 to 21.

In the hammering test the subject used a specially prepared hammer, to hit three points, distant from each other by 50 cm. Time was constant, measured by the beats of a metronome, at the average rate preferred by ten boys. An improvement in the apparatus records each hit electrically on a kymograph. There were very marked differences in the abilities of the boys, the hits ranging from 0 to 20 in 50 shots.

The 3-hole test is too well known to be described. Time was taken for 50 contacts.

A. T. POFFENBERGER, JR.,
Secretary.

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REVIEWS AND ABSTRACTS OF LITERATURE

Catholic Democracy: Individualism and Socialism. HENRY C. DAY, S.J.
New York: Longmans, Green, and Company. 1914.

Father Day, who is happily fitted for the difficult task by both temperament and training, has written a brief, but suggestive, book of less than three hundred pages on a very large subject; and he has written it candidly and well. His purpose is to delimit what may roughly be called

the social question on its more religious side and to show how it is related to certain vital positions jealously maintained by Catholic Christianity not only in its more articulate past, but also to-day. It is not primarily, we should remark, a polemical work, in spite of sundry hard sayings in which the author does not hesitate to affix labels and to forecast unlovely issues; it is rather a candid essay in exposition, intended chiefly to direct the attention of plain but thoughtful men to the Church's instinctive interest in the economic arrangements of this world. Some fourteen chapters are devoted to the history and analysis of the ideas lying behind the thing known as *social democracy*. These chapters are necessarily brief and at times almost too suggestive of a certain naïve sketchiness in the method, as though the author were determined that no one should accuse him of not having gone to the roots of the subject; but it is impossible, nonetheless, not to be impressed by the lucidity and cogency of a great deal of his argument. This is particularly evident in his account of the subtle and prevailing mood of prejudice that may be said to react against Catholicism, not only in the minds of the masses in what were once the Bourbon strongholds of Europe in days not so long since past, but also in the more considered judgments of many an academic writer from whom one has a right to expect some acquaintance with the political forces that went to shape the world of the last two centuries as men of education know that world to-day.

But it is in the series of chapters in which he has made the bold attempt to find a definition of socialism acceptable to all schools that Father Day's especial merit as a writer on these hazardous themes comes home with force to the mind of the detached reader. "Socialism," he tells us in an admirable sequence of eight conclusions, "is primarily an economic scheme, having for its principal object the socialization of the means of production. Its immediate concern is with food and labor. . . . Instead of the present system under which individual owners of capital are in consideration of their private interest, and only checked by the competition of others, consent to supply society with the products it demands, the new scheme provides that the whole community, now possessing 'Collective capital'—that is, all the means of production—in common, and having all its members united in social labor groups shall publicly regulate 'Collective labor' of all, and equally distribute its results to individual laborers." Secondly and subordinately, he goes on to infer, socialism is a kind of instinctive and rapidly growing conspiracy against the present order for it implies, he tells us, "a complete civil policy affecting the relations of individuals to the state, the family, and the church"; and all present-day "agitations in favor of universal suffrage, state care of children, secular education, the spread of materialistic conceptions of life, and the spirit of revolt against traditional and established authorities are, for Father Day, but so much disquieting evidence of a widespread, not wholly self-conscious, determination "to break down the present economic system."

What he calls the "logical entity of the system" and its "essential idea" is the collectivist principle applied to industry. Socialism in

concrete, of course, is a much more Protean thing, and may best be studied in the platform pronouncements and the political activities of the various groups of socialist agitators in Germany, France, Italy, England, and the United States. In this latter phase it is in reality a movement towards genuine democracy; it believes in the omnipotence of the state; and has unquestioning faith in the efficacy of doctrinaire legislation; and its advocates rightly claim to be known as *social democrats*. And so Father Day arrives at the following definition of the system as a whole; "Social Democracy, or Socialism, is a system of political economy, which denies the right of private ownership of capital, and attributes to the democratic state the inalienable ownership of all the means of production, together with the duty of the administration and distribution of all economic goods" (pp. 123-126). Two observations suggest themselves to the author as he formulates this definition; and as they throw light upon the real ethos of his book, and lay bare, at the same time, his instinctive and initial sympathy with those who are striving to set an economically crooked world straight; we feel that we ought to transcribe them. "The first is that the Socialist scheme as it stands can not be regarded as a fixed system. Socialism is still in a fluid state. It is a living movement which is actually changing from day to day, and is liable to still further changes. How the movement is to develop will depend, to a large extent, on the degree of wise and sympathetic understanding which is accorded to it. . . . The second observation, which follows as a corollary from the first, consists in a warning against the dangerous assumption that everything contained in Socialist teaching is false."

Obvious and almost commonplace as these statements may appear to the merely academic reader, we think them admirable as coming from a man of Father Day's peculiar and all-but-authoritative position; and one is glad to note how completely they justify the word of admonition with which Cardinal Bourne has had the courage to point his own prefatory letter to the work. "Catholics are sometimes very unfairly dubbed Socialists because they are unwilling to condemn as contrary to Catholic teaching remedies suggested by Socialists, which, however undesirable in a political or economic aspect, still do not contravene the teaching of the Church on faith or morals. Experience has shown how difficult it is to obtain from either Socialists or non-Socialists anything approaching a clear definition of what they really mean. And it is most unfair to appeal to the teaching of the Catholic Church in support or condemnation of theories on which she has not pronounced directly or indirectly."

It seems a pity, however, that in preparing what he calls the economic indictment of socialism Father Day should have had recourse for his text to a flamboyant and highly rhetorical Manifesto issued by the *Socialist League* at the *General Conference* held in London in 1885. A good deal of water has run under socialist bridges during the past thirty years, and even a platform apologist of to-day might reasonably decline to be judged by the pronouncements of his forebears of a generation ago. Nor is it quite fair to reproach socialists as a whole with attempting the

impossible because of the difficulty of distributing to each unit in the body politic "the full value of his labor." Socialists might reply, as in point of fact many of them do reply, that the problem is ultimately one of averages, and that the system might conceivably be better than the present chaotic arrangement in substance, even though it failed, and failed poignantly, here and there in detail. Nor is the attack on the socialist's attempt to eliminate the "master's profit" in better logical case; and the apologist for evolutionary socialism would, we suspect, make as short work of it as of the argument we have just noticed.

Indeed it might be said in general that the economic argument to which he devotes an entire chapter of some seventeen pages suffers from first to last because of a certain lack both of definiteness and of what the French call *actualité*. This is not to say, however, that the argument is radically unsound, or that the author is a mere clerical amateur in the matters that he handles with such an air of expert knowledge. If we understand him aright, his main contention would seem to be that the present tendency towards collectivism may lead society into dangerous pitfalls if it is not checked by a wise regard for individual initiative and liberty. "Society and Socialism," he observes with characteristic terseness, "are conflicting and irreconcilable terms." Neither by the peaceful methods of progressive and evolutionary amelioration, nor by the more drastic appeal to revolutionary force, will the fusing point of such opposites ever be reached. Material environment may change, but human nature endures. One may call such an argument economic, if one will; but *au fond* it is an appeal to psychology, backed up by isolated instances of capitalistic or industrial history. It assumes that certain auto-centric tendencies in human nature, as we know it to-day, or even in its remotest traditions, are radical and will not change; and assumptions of that sort are, we repeat, purely psychological. What is particularly valuable in Father Day's use of the argument, by whatever name it may be called, is the suggestion of tolerance and the vigorous grasp of economic principle that accompanies it. The socialist will probably quarrel with it, or turn from it with contemptuous impatience; but the man in the street for whose as yet unwarped consideration it is candidly offered will think twice before thrusting it aside.

The moral or religious appeal of the book, especially in the case of those who may be sincerely curious to know where Catholic Christianity stands on these issues, is, we need scarcely remark, the best and most convincing thing about it. The author has no difficulty in showing that the most representative exponents of the socialist idea during the past generation have, in Heine's mocking phrase, left "Heaven to the angels and the sparrows," and aimed, like Bebel in Germany, at "the establishment of Atheism in the domain of what is called religion to-day"; but his chief endeavor is to show that the economic pressure of the time has, from the very nature of the problems raised, a most interested observer in Catholicism. There is no romantic appeal to an impossible revival of medievalism, as is but too often the case when the average religious apologist takes up these thorny matters; there is little talk about "guilds"

or "confraternities," though these are not ignored; but there is a great deal about fundamental Christianity; about the relations of the wage-earner to his wage; about usufruct and the limits of individual ownership; and the relations of the religious conscience to the not-omnipotent state. This part of the book is admirable in spirit as well as in treatment; and the author is at his best when girding, not ill-naturedly, at a certain class of clergyman, with which we are not unfamiliar even here in the United States, who would find in the Christ of the Gospels, not primarily a divine teacher with a message to the religious conscience of mankind, but a kind of Hebrew Tolstoi born too soon into a muddled world and coming only at this late day somewhat precariously into His own. Throughout this portion of the argument Father Day attacks many a pet notion of the time, reminding his readers more than once that there has been, since the days of St. Thomas of Aquin and earlier, a Catholic and scientifically formulated doctrine of society and the state that *advocates a system of moderate but extensive ownership of capital, especially of land.*

Especially of land! It is to be regretted, that, in committing himself to so courageous a statement, Father Day should have made no reference to a distinction upon which much stress was wont to be laid by the great Spanish theologians of the sixteenth and early seventeenth centuries—the distinction, namely, between those rights of ownership which may be said to be rooted in the nature of things and those which are derived from the *ius gentium*. Private ownership in land, it was contended by these thinkers, is just one of these latter rights. It might be modified, or restricted; and there might even arise certain junctures when the higher interests of society would modify it out of all recognition by the apologists of the present order of things. How is latter-day Catholicism minded towards these problems? It is always safer, of course, to prophesy what will not happen in theological matters than to permit oneself to dogmatize on what will. A Church which has seen more than one social order come and go, and which shows itself as singularly alert as Rome does to-day to the crisis that confronts her, is not likely to be dismayed, however confidently extremists may talk on one side or the other. There is, of course, an irreducible minimum which she can never consistently surrender. She will not give up her idea of the family; neither will she be disposed to efface all distinctions between the *meum* and *tuum* of capital and labor. But one thing may safely be hazarded. Her sympathies will probably be extended to all that will be of good report in the social welter of the next half-century. In the simple language of her catechism she has always taught that "to defraud a laborer of his wage," or "to oppress the poor," is one of "the four things crying to heaven for vengeance"; and it is in this spirit, one feels, that Father Day has written the closing chapters of his remarkable book. We are confident that, as Cardinal Bourne so pointedly put it, they will "help in clearing men's minds and in restraining any mere tendency to hasty conclusions" either for social democracy or against it.

C. CLIFFORD.

ST. MARY'S,
WHIPPANY, NEW JERSEY.

Berkeley and Percival. BENJAMIN RAND. Cambridge: University Press, 1914. Pp. x + 302.

The purpose of this book is best expressed in Dr. Rand's preface:

"This volume contains the hitherto unpublished correspondence of George Berkeley, afterwards Bishop of Cloyne, and Sir John Percival, afterwards Earl of Egmont. The collection of manuscripts from which the correspondence was taken is in possession of the Right Honorable Earl of Egmont. This collection was originally made by the first Earl of Egmont largely to serve as material for a history of the Percival family, that appeared in 1742 under the title of 'A Genealogical History of the House of Yvery.' Those portions of the collection relating to Berkeley and Percival comprised in this present volume are found in the nine volumes of 'Letter-books,' 1697-1731, the twelve volumes of the 'Journal of Percival,' 1731-1747, and the seven volumes of 'Original Letters,' 1740-1751. The copied letters which passed between Berkeley and Percival from the 12th of September, 1709, to the 15th of December, 1730, scattered through the 'Letter-books,' form the bulk of the present volume. The 'Journal of Percival,' which began in 1731, shortly before the time the 'Letter-books' end, yield various memoranda showing the continuance of the friendly relations between them in the later years of their lives. The two letters signed by Berkeley as the Bishop of Cloyne and the two by Kene Percival, are taken from the 'Original Letters' of the Egmont collection.

"Some account of the Egmont collection is given in the 'Appendix' to the Seventh Report of the Royal Commission on Historical Manuscripts (pp. 232-249), printed in 1879. It contains the dates of the letters, accompanied by various brief extracts from the correspondence in the 'Letter-books' between Berkeley and Percival. Four letters from this collection, bearing date 6th Oct., 29th Nov., 10th Dec. and 27th Dec. 1709, appear also in the 'Report on the Manuscripts of the Earl of Egmont by the Manuscript Commission' in 1909, Vol. II., pp. 241-245, but the calendar of these papers ends with the reign of Queen Anne. Mr. Alexander Campbell Fraser, the foremost Berkeleyian authority, had access to the 'Letter-books' of the Egmont collection and made use of such extracts as seemed suitable for biographical purposes in the preparation of his volume on 'Berkeley' which appeared in 1881, and of his memoir of Berkeley, prefixed to the new edition of the latter's works published in 1901. The letters between Berkeley and Percival have, however, remained with the exceptions noted, unprinted in their entirety until the present volume. Percival's 'Journal' has also been drawn upon solely by Lorentz¹ to exhibit his later relations with Bishop Berkeley.

"The lives of 'Berkeley and Percival' are presented in the form of 'A Biographical Commentary,' which precedes the 'Correspondence.' This historical narrative will be found not only to exhibit the relations of Berkeley and Percival, but also to embody at the same time all such explanations as have seemed necessary for the elucidation of the 'Correspondence' and the 'Journal.' The foot-notes of the 'Correspondence'

¹ *Arch. f. Gesch. d. Philos.*, XIV., 1.

are thereby confined almost entirely to those marginal notes which Percival made throughout his copy-books of letters in 1736 with reference to his correspondents and to the persons mentioned in the text. No cross references have been used between the 'Biographical Commentary' and the 'Correspondence' since these follow a similar chronological order."

It was at Trinity College, Dublin, that Berkeley first made the acquaintance in 1708 of Sir John Percival, afterwards first Earl of Egmont. Their correspondence, which lasted thirty years, shows a delightful intercourse of unbroken friendship. The following letter (p. 80) from Percival to Berkeley, dated August 26, 1710, at London, is worth repeating entire for its account of the first impressions produced by "The Principles of Human Knowledge":

"D^r. S^r,

"Four days ago Col. Percival, who came from Ireland, brought me your book concerning the 'Principles of Human Knowledge,' which he saw by accident on a bookseller's stall in Dublin made up and directed for me, and so brought it away, till when I had not seen it, for that you designed for my Lord Pembroke never came to my hands, however it won't come too late for he is yet in the country.

"Tis incredible what prejudices can work on the best geniuses, nay and even on the lovers of novelty, for I did but name the subject matter of your book to some ingenious friends of mine and they immediately treated it with ridicule, at the same time refusing to read it, which I have not yet got one to do, and indeed I have not yet been able to discourse myself on it because I had it so lately, neither when I set about it may I be able to understand it thoroughly for want of having studied philosophy more. A physician of my acquaintance undertook to describe your person, and argued you must needs be mad, and that you ought to take remedies. A Bishop pitied you that a desire and vanity of starting something new should put you on such an undertaking, and when I justified you in that part of your character, and added the other deserving qualities you have, he said he could not tell what to think of you. Another told me an ingenious man ought not to be discouraged from exercising his wit, and said Erasmus was not the worse thought of for writing in praise of folly, but that you are not gone so far as a gentleman in town who asserts not only that there is no such thing as matter but that we have no being at all. My wife, who has all the good esteem and opinion of you that is possible from your just notions of marriage-happiness, desires to know if there be nothing but spirit and ideas, what you make of that part of the six days' creation which preceded man.

"I have given you a plain account as I believe you would have me do what success the name of your book has had here, for I can hardly say they know any more of it, and shall endeavour to persuade people to read it, but by what they have already shown can scarce believe they will do it impartially.

"I am, S^r,

"Y^r affect. friend & hum^{ble} Serv^t,

J. P."

In his reply of September 6th Berkeley makes the following somewhat elaborate statement (p. 83):

"As to your Lady's objection, I am extremely honoured by it, and shall reckon it a great misfortune, in case any prejudice against my notions should lessen the good thoughts, you say, she is pleased to entertain of me, so I am not a little careful to satisfy her in point of the creation's consistency with the doctrine in my book. In order to which I must beg you will inform her Ladyship that I do not deny the existence of any of those sensible things which Moses says were created by God. They existed from all eternity in the Divine intellect, and then became perceptible (*i. e.*, were created) in the same manner and order as is described in Genesis. For I take creation to belong to things only as they respect finite spirits, there being nothing new to God. Hence it follows that the act of creation consists in God's willing that those things should be perceptible to other spirits, which before were known only to Himself. Now both reason and scripture assure us there are other spirits (as angels of different orders, etc.) besides man, who, 'tis possible might have perceived this visible world according as it was successively exhibited to their view before man's creation. Besides, for to agree with the Mosaic account of the creation it is sufficient if we suppose that a man, in case he was then created and existing at the time of the chaos, might have perceived all things formed out of it in the very order set down in Scripture which is no ways repugnant to our principles."

In Paris on November 24, 1713, Berkeley expected to make the acquaintance of Malebranche, but the correspondence contains no reference to the meeting.

The letters between Berkeley and Percival are very simple and personal; they tell about all sorts of things, family and personal affairs, political circumstances, the impressions of a traveler. One might almost imagine that philosophy was the topic of least mutual concern, although according to Dr. Rand, Berkeley had "in Percival an interested, but unskilled correspondent in the philosophical realm" (p. 7).

The volume is a valuable supplement to Fraser's edition of Berkeley's writings.

WENDELL T. BUSH.

COLUMBIA UNIVERSITY.

JOURNALS AND NEW BOOKS

REVUE PHILOSOPHIQUE. November, 1915. *La morale sociologique et la crise du droit international* (pp. 385-414): GASTON RICHARD. - "Percivalistic and evolutionary sociology trusts to the social future to eliminate automatically militarism and the causes of war, while giving as the reason therefor that militarism . . . is in conflict with a growing internationalism." But Darwinistic sociology has really contributed to undermine the moral postulates of international right through its determinism

the conception of distinct and irreducible social species. "The restoration of the foundations of international right will be the common work of juridical sociology and of that new philosophy which, under the different names of philosophy of action and philosophy of values, takes the will for its object." *De la nature et de la valeur des explications* (first article, pp. 415-439): G. FONSEGRIVE.—". . . the process of explanation has passed through a number of phases. Common sense commenced by explaining by images and by comparisons, then philosophy sought explanation in the conditions of existence: becoming, being, atoms, numbers, substances, essences, ideas. . . . Modern science tends to suppress or at least to neglect every reason of a metaphysical order in order to explain laws, yet regards the laws as the explanation of the facts . . . although insisting even on the symbolism of theories, it does not the less avail itself of theoretical symbols in order to explain the real . . . certain more rigorous and clairvoyant spirits assert that the laws themselves furnish no kind of explanation." *L'idéal quietiste* (pp. 440-454): TH. RIBOT.—"The purpose of this article was to study (quietism) in its constitution and evolution as pushed to the extreme . . . to show that it is a morbid state which could be explained as such." *L'obsession et l'idée prévalente* (pp. 455-469: last article): ALBERT LECLÈRE.—Considers the principal varieties of obsession, and concludes that: "neither obsession nor even the prevalent idea presupposes an alteration of the reason. . . . Both presuppose a minimal defect of intelligence situated on the level of a faculty . . . that one can call the 'faculty of apprehension.'" *Revue des Périodiques étrangers*.

Crawford, J. Forsyth. *The Relation of Inference to Fact in Mill's Logic*. Philosophic Studies Issued under the Direction of the Department of Philosophy of the University of Chicago, Number 5. Chicago: University of Chicago Press. 1916. Pp. 50. 50 cents.

Crile, George W. *Man—An Adaptive Mechanism*. New York: The Macmillan Company. 1916. Pp. xvi + 387. \$2.50.

Dunham, James H. *Freedom and Purpose: An Interpretation of the Psychology of Spinoza*. Philosophical Monographs, Vol. I., No. 3. Princeton, N. J.: Psychological Review Company. 1916. Pp. 126.

Freeman, Frank Nugent. *The Psychology of the Common Branches*. Boston: Houghton Mifflin Company. 1916. Pp. xii + 275. \$1.25.

Levy, J. M. *Experiments on Attention and Memory, with Special Reference to the Psychology of Advertising*. University of California Publications in Psychology. Vol. 2, No. 2. Berkeley: University of California Press. 1916. Pp. 157-197.

Mayman, J. Edward. *Teaching Elementary Science in Elementary Schools*. Department of Education—The City of New York. Division of Reference and Research. 1915. Pp. 163.

NOTES AND NEWS

THE Herbert Spencer lecture at Oxford University was delivered on March 15 by Professor J. Mark Baldwin. Taking for his subject "The Super-State and the 'Eternal Values,'" Professor Baldwin spoke of the distinction, on one hand, between instrumental and eternal or absolute values, and, on the other, between individual and super-individual values. Pointing out that these distinctions are not peculiarly German, he went on to show that with the advent of the present war it became evident that in the German conception the State is not a vehicle of simply individual or instrumental value. It is, according to the Germans, the expression of the full national will; it is value *per se*, summarizing in itself the two super-individual values. The monarch symbolizes this; no concession to the popular will is possible under such a conception, but the populace may be the recipient of free gifts from the State. Natural selection, or the survival of the fittest, is recognized, as, for example, in the victory of Turks over Arabs in the thirteenth century, or of Rome over Greece. Germany recognizes two kinds of fitness—military efficiency and organization. The spiritual and ethical weapon is wielded by the State alone. Military necessity knows no moral law; "might is right," i. e., super-individual might makes individual right. The observance of treaties is subordinate to the needs of the State; to be once a German is to be always of super-individual value; "Deutschland über Alles." So much for the German ideal. The opposed point of view makes itself felt in various domains, as in that of naturalization, where the experience of the war has proved that documentary evidence is useless; in that of arbitration; and in that of cultural relations between peoples. In fine, Germany says that the nation is instrumental to the State; the democratic belligerents opposed to Germany hold that the State has an instrumental value only, and that it is instrumental to the nation.—*Nature*.

ANNOUNCEMENT is made of a prize of \$1,000 for the best thesis written by a woman on a scientific subject, psychology being included among the subjects. The thesis must embody new observations and new conclusions based on independent laboratory research. Theses offered in competition must be in the hands of Dr. Lillian Welsh, Goucher College, Baltimore, Maryland, before February 25, 1917.

DR. ROBERT M. OGDEN, professor of psychology in the University of Kansas, has been elected head of the department of education in Cornell University and will take up his work there at the beginning of the next academic year. Dr. William S. Foster, now instructor in psychology in Cornell University, has been made assistant professor of education.

ON March 21, Dr. Shepherd Ivory Franz, of Washington, D. C., addressed the students of Swarthmore College on "The Psychology of Deceptions" and on March 28, Professor Warner Brown, of the University of California, on "The Psychology of Advertising."

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PSYCHOLOGY AND SCIENTIFIC METHODS

PROFESSOR MACINTOSH'S PRAGMATIC REALISM

PERHAPS it is intrinsically no harder to write an adequate history of current philosophy than to write one about past philosophy. But the historian of the past has a great advantage. His limbs are safely away, and their spirits come not back to reproach for quoting verbatim what once they were incautious enough to say. So much the more honor to him who takes the risk and lives of philosophers still alive, if he be in his work thorough and sincere. He will be criticized in turn, but the very denial and reversal will make issues clearer. I am led to speak thus by a recent attempt, made by Professor Macintosh, of Yale,¹ to review the whole recent discussion of theories about knowledge. Being the result of a astonishing range of reading, and itself as readable, and even at times humorous, as the subject perhaps admits, it is likely to become a work of reference for busy students. For this purpose its citations, references, and indices well adapt it. But any such review has its dangers, its fallacies of accent, its failures of full sympathy, and the present work is no exception. This is perhaps the more noticeable where there is merely passing reference to a lesser philosopher, though sometimes it appears in more important passages. I make no pretense, however, to a more omniscient scholarship than Professor Macintosh's, and here purpose rather an examination of what he has positively to offer as his own constructive theory.

This positive contribution, by the plan of the book, is forced back towards the end, but the criticism which precedes occasionally turns it, so that the reader has the same impression as from a long human sentence with the verb at the end. Professor Macintosh announces himself a non-dualist realist and a pragmatist; and his criticisms grow in interest as he approaches views similar to these. In the earlier and long section on immediate knowledge, his denigration of dualists who ought to be agnostics, and of idealists, the menagerie of Absolutes shows a hereditary taint, becomes, if

Macintosh, D. C. "The Problem of Knowledge." Macmillan. 1915. p. x + 503.

read continuously, something akin to the Homeric "catalogue of ships." Professor Macintosh omits scarcely any one who writes in English, French, or German (I note Santayana and a few Frenchmen), though the discussion of Hocking shows how much more illuminating a detailed treatment of a few typical examples might be. And when he arrives at the new realists, his discussion, though more varied, centers about secondary qualities. For the whole exposition is intended to lead up to his own theory as to secondary qualities, a theory which is to be a happy combination of tradition, scientific philosophic critical inquiry, and common sense, and which is to settle the problem so completely that the problem itself will cease to exist.

The theory proposed is somewhat as follows. Idealists and realists are right, as against the dualists, in saying that knowledge may bring us directly into contact with reality, but they are wrong in saying that this contact, in the case of a physical reality, occurs in our acquaintance with secondary as well as with primary qualities. No, the primary qualities alone are objective. But primary qualities were not perceivable by themselves until the soul, in animal and man, enriched them by fusing with them secondary qualities of its own making. It is much as when the microscopist, unable to distinguish the parts of his histological preparation, puts a stain upon it which is such as to affect some parts only, thus bringing them out against the background of the unstained portions.

This theory is a clever suggestion, but I fear the author claims for it too much. He calls it critical realism, as against the dogmatic realism which treats all qualities alike. I gather that dogmatic realism is any realism which needs to be criticized, and critical realism is that form which can afford to be dogmatic. For he fails to apply his own arguments to it. Take an instance in point. Professor Macintosh (pp. 246 and 266) criticizes Wolf for attempting to distinguish between the perception of a thing, as receptive, and the perception of an hallucination, as creative. These, he says, are, as mental processes, "essentially identical in kind. If there is creativity in the one, there is creativeness in the other." Yet just this "unavoidable compromise" does Professor Macintosh himself propose, when he would distinguish—"where psychological science finds an essential identity"—between the sensing of primary and of secondary qualities. And is it the case that an hallucination contains no primary qualities, and what of primary qualities as seen by aid of a microscope or mirror, or seen in dreams? Doubtless we can "learn to ignore" (p. 326) or "easily correct" the illusions about primary qualities, but how can there be primary-quality illusions at all? What does Professor Macintosh mean the primary qualities never

sensed, and if so, why is this theory called "*epistemological monism*"? The next step might well be to play a *Berkeley to Professor Macintosh's Locke*. Indeed M. Bergson has already done it: *explicit extension*, though suggested by the *vague extensity experienced*, is, in its clear-cut form, the product of intellect, and created for purposes of action!

Or again, Professor Macintosh holds (p. 238) there is *self-contradiction* in the opinion of Moore and Nunn that an object may have two colors at once,—though the case of "luster" might have suggested a doubt. Yet he admits the different colors seen are in the object—he tells Professor Fullerton (p. 247) that there is no dispute on this point—only not "independently" there. If "not independently" means "not really," Professor Macintosh has the contradiction; if it means "really there," but only "under conditions," why is the "dogmatic" realist's opinion more contradictory? Nunn, indeed, says the physical eye is not one of the conditions, or seems to say so, but this aside, just what is the difference? Some "dogmatic" realists prefer to say "functional relationship" rather than "causal condition," but they generally admit the object really has a different color in daylight than under artificial illumination. Only, the "dogmatic" realist does not include among the conditions a mind. That is, he says that under certain conditions there arises a color quality in the object; Professor Macintosh says that under these *same* conditions, the *same* color arises in the object—put there by the creative activity of a mind. The issue then is: Is this king, brought in to do nothing but sign the speeches his prime minister has written, not a personage with whom we might, by Professor Macintosh's favorite "principle of parsimony," dispense? "Dogmatic" philosophers generally avoid such conceptions as "creative activity," because such conceptions explain everything, and would explain everything equally well if it were different from what it is.

All else that Professor Macintosh has to say about realism seems to add only a little to his thesis, some of the more apparent defects of which we have just been considering. Thus he accuses new realists of *hypostatizing abstractions*, which I think is in some cases true; but he gives us little on the questions really troublesome about *universals and relations*. Thus he says—discussing (p. 332) the "*externality*" of relations—the change made in the object by the knowledge relation may be, for the purpose of that knowledge itself, *unimportant*, and hence the knowledge relation may then be considered *external*. He generalizes this by saying (p. 49): "If the relation makes a difference in the object for our purposes, it is, for us, a relation internal to the object; if it makes no difference, it is external."

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The idealists come, at least verbally, very near to Professor Macintosh at this point, when they say that all relations "make a difference" to their terms, but "for practical purposes" we may sometimes neglect these differences. But Professor Macintosh, however, seems further to hold that only causal relations are "objectively internal." Does the above reference to purpose mean that some purposes are such as to take into account the relation in question, while other purposes have occasion to consider only the term related, without considering the relation? Then, in the former case the relation might be denominated "*internal to the purpose*"—but who ever denied it?

The great difficulty in this question of "externality" of relations is to find exactly where the issues join, what the problem is. On one side says that even the believer in atoms and the void admits that each particle attracts every other, and is thus a monist. Whereupon his opponent replies that the attraction does not alter the interior of the atoms, and the attraction of any two is independent of any third body, hence pluralism. And so it goes. Mr. Bertrand Russell describes the "external" theory, saying, "Relatedness does not imply any corresponding complexity in the *relata*,"² but everything here turns on the interpretation of "corresponding." When restated as denying that "every relation is grounded in the natures of the related terms," even Mr. Russell's favorite example of "difference" seems to tell against it. For is not even the numerical difference of *A* and *B* founded on each being an individuated numerical unit? And when we consider qualitative difference, surely Mr. Bradley was wise in choosing it as his best example of the "grounding of relations in the natures of the related terms." Mr. Joachim cheerfully disposes of all cases to the contrary by saying they are not relations at all, they are mere "coincidences!"⁴ But even if we decline to follow Mr. Joachim, we must admit Mr. Russell's own cases tell against Mr. Russell. But the Bradley contention is scarcely a whit better. For while it may be that red and blue are different because of the "natures" of the two, yet I can scarcely believe blue would be less blue to him who had never dreamed of red. Yet that the two are what they are only as distinctions within a whole that includes them—such is what Bradley is trying to prove.

There is some gain if the issue of monism-pluralism is transposed to the field of one relation only, the whole-part relation. But the two sides again fail to convince one another. For instance, Mr. Bernard Bosanquet seems well satisfied with his own conclusion

² This JOURNAL, Vol. VIII., page 158.

³ *Aristotelian Society Proceedings*, 1906-7. New Series, Vol. 7, page 37.

⁴ *Mind*, 1907, New Series, Vol. 16, page 412.

this respect: he tells us⁵ it is "an insight substantially just" which he himself possesses, and on which true idealism is founded, that a mind is a whole, its objects always fragments. Yet verbally this might be admitted by many a pluralist realist. It is true the realist might then add an explanation less pleasing to Mr. Bosanquet, that a whole is dependent on its parts in a way in which the part is not dependent on the whole, and if the "things" of every-day thinking are in some respects fragments, it does not follow they are fragments of mind. The worst contradictions modern logic knows anything about have arisen through efforts to define a part in terms of the whole of which it is a part—compare the problems leading up to Russell's "theory of types"—and those of us who have considered these are cautious even about "insights substantially just." But of the complexity of all this, and the present anarchical mess resulting from attempts to defend a thesis rather than to inquire, Professor Macintosh gives us scarcely a hint.

Before leaving the topic of "immediate knowledge," perhaps I might venture a word as to the sense in which, it seems to me, the qualification "critical" is best employed of a realist philosophy. Suppose the mind of a weak individual person placed amid a very big world. It is almost infinitely improbable, is it not, that what came to its notice first should be anything important or fundamental? Surely, then, such a mind had needs be critical; with that which first comes before it, it ought to be dissatisfied; even as the absolute idealist says: "The immediately given must suffer mediation." M. Bergson tells us that to understand reality, we must needs plunge into it. Though metaphors are but metaphors, I should prefer to say we had better stand back from it, get far enough away to overcome the tyranny of the foreground. Now this sort of mediation, called for by the realist's own presuppositions, may involve elaborate thought; but the resultant good knowledge may, nevertheless, when we get it, be immediate and not "saturated with thought," be a new contact of ours with what is, and has been, fundamental in reality. To insist that thought must, by such mediation, be woven into reality itself, is like arguing that what I have had to reach by a long road must be far away from me when I get it. The process of mediation is not a process of helping the Absolute make the stars and Milky Way; it is a much more pedestrian and earthly activity—cleaning our lenses, placing and focusing our telescope. I am not sure a mind may not succeed in being creative in the sense of muddling its immediate surroundings and defeating itself, or even in the more useful way which Professor Macintosh postulates—these are hypotheses which might be

⁵ B. Bosanquet, "The Distinction between Mind and its Objects." Adamson lecture at Manchester University, 1913, page 38.

subjected to some sort of scientific verification. But the best creative mediating activity in knowledge is in the direction of depersonalizing it, and calming one's own self-assertiveness. This is the critical attitude. And I care not if, in saying what I have just said, I seem to be defending that "outworn" opinion that theory is antithetical to practice and epistemology distinct from metaphysics.

We may now turn to Professor Macintosh's section on "mediating knowledge," wherein "mediate" is used in another sense from that just mentioned, and has reference to representative knowledge. The problems of truth and of proof are here treated, again with collation of many views, but with especial sympathy for pragmatism.

I remember having read Professor James's book "Pragmatism" near the time of its publication, with great satisfaction. What I remember there was a method of handling *conceptual* knowledge, a method which, as I understood it, said that of any two theories about the actual world, neither in violent disaccord with known facts, the one of the theories was to be preferred which was the more detailed, the more specific, the more capable of further verification. It was to be the more detailed in the sense that it told more of the "particulars" of things; the more specific in that it would fit one set of facts, but would not fit any other imaginable set equally well. But lest we should become scholastic in our multiplication of details, we were to say that no detail was anything more than a verbal distinction unless we could find, or definitely define in terms of factors known to exist, a situation wherein some one would have different direct experience or be obliged to act differently because of that detail,—of the detail itself, not of its expression by us. This seemed to me good, a method capable of application to many theories popular among philosophers, and I announced I was a pragmatist. But behold, I learned from friends who were worried about my spiritual welfare, that in calling myself a pragmatist I had committed myself to the doctrine that there is no solid fact anywhere, "I believe what I like and you believe what you like." What became of my unhappy "pragmatic method," I know not to this day. But, nevertheless, I still read with hopeful interest what pragmatists have to say, though now they talk only about definitions of truth. Professor Macintosh has one of these definitions of truth to offer, which says that judgments are working hypotheses, used instead of immediate knowledge, and true whenever we ought to use them, they lead us to perform the same actions as immediate knowledge would. This theory he calls "representative pragmatism."

I wish to praise, first, that side of Professor Macintosh's "representative pragmatism" which seems to me very good. Whatever

may be that makes up a judgment, we do make it for purposes, and it is representative of a reality we do not now have. It is well to call a judgment a "working hypothesis"; if we call it simply an "hypothesis," this would suggest that the purpose for which we made it was verification, whereas, in general, we make a judgment just precisely to save ourselves from seeking out that reality for which it stands. Its analogy with a financial credit has been well used to illustrate these points. If I have credit, it is something which could be turned into cash, but that is just what I usually do not want; and though, of course, there are times of inflation when turning into cash would be impossible and times of depression when efforts are made to turn everything into cash, the better situation is neither of these. And no financier has yet postulated a financial Absolute, whose duty it is actually to turn all my credit into cash; such an Absolute would be the embodiment of a financial panic. The granting of a new credit is frequently intended to stabilize the already existing credits, like one of Professor Dewey's mediating "ideas." The great purpose of credit is efficient economic action. The function of judgment is analogous to these functions of credit, but the stuff and structure of judgment is, of course, noetic and not financial.

Just what, then, is the structure of judgment? Professor Macintosh says it is the representation of reality by idea. Let me illustrate his actual use of this thesis by an example. Suppose Professor Macintosh is looking for cherries. He says to himself, "cherries are red," and thence infers, "I seek something which is red." With this in mind he looks for red objects and ignores green and blue. In his search he may have no occasion to recall that cherries are red only on the outside, and only when ripe, and in normal light with normal vision. In short, what Professor Macintosh is telling us is that we can call the judgment, "cherries are red," true, even though it be vague to the extent of omitting a qualification; such, for example, as that cherries are red only on the outside, provided we never appeal to the judgment in any situation where that qualification would make a difference to our actions. If this is what he means, I welcome it. And it seems to be the sum total of what he does mean.

But is this an account of the representative character of judgment? On the contrary, what is representative in the above example occurs only in the inferred judgment, namely, the description, "something red." And in this connection, has Professor Macintosh ever heard of, for instance, Mr. Russell's "theory of description"? But in making the judgment, "cherries are red," where "are red," as a unit, is the verb, the maker simply does not mean that "redness" represents "cherries." He may infer, "cherries are

red objects," where "are" is indeed the verb, but it indicates no representation, but class-inclusion. In scarcely any case does the verb "is," properly understood, mean either representation or ideality. I wish Professor Macintosh had given more explicit chapters and verse when he accuses intellectualism of being unable to state how the subject can be the predicate (p. 400). It certainly does not apply to any present-day logician whose opinion is worthy of consideration, unless it be some of the idealists.

There is a remark made by Professor Macintosh which would really bring him much nearer the deeper analysis of judgment than would this borrowing from Bradley of the thesis that judgment applies a predicate to reality, but the remark in question is his final conclusion, not further developed. Truth, he says (p. 452), is *selectiveness* "in all situations calling for decision between the judgment and its contradictory." But this decision is the act of judging itself; the "judgment" here mentioned had best be called the proposition, though "proposition" is unfortunately also used both of the statement in words and of the objective fact, as well as of the content judged. An act of judging is, indeed, like a moral decision: it is the culmination of a process wherein an alternative gets more and more clearly discriminated from other alternatives; and is a decision finally rendered, accepting or rejecting. As Mr. Russell's friend Ludwig Wittgenstein has stated it, in speaking of judgment at its highest development, a proposition is a bipolar thing; it and its contradictory are not separate, but are like the two ends of a balance; if you push down the one, you raise the other. You understand it when you understand both sides; you judge when you claim that one side is to be accepted and the other rejected. Of course, you cannot claim it true, your decision can not make it true, and in that sense it remains a working hypothesis; but the existence of just this bipolarity is what distinguishes a judgment from an ordinary working hypothesis. The bipolarity is what distinguishes proposition from fact, and makes it not a mere tautology to judge, even when the fact is immediately before one.

This brings me to the last topic I wish to mention, namely, the knowledge of possibility. If the judgment is a decision, then there must have been put before the mind possibilities, finally narrowed down to two, which are such that only one of them can be real. Judgment involves, therefore, a comparison of what is with what might be. And if it is to be used as a working hypothesis, it must, as Professor Macintosh says, lead us to perform the same actions as if we had direct knowledge of the reality judged about, hence again a comparison with what *might be*. You can not escape such comparison with what might be.

Possibility is an ambiguous word. It may refer to my ignorance as in, "It may have been so"), or to existential possibility (as in, "Is it possible for this described object to exist?"), or to qualitative possibility (as in, "What would be the character of this object, if it did exist?"). *Existential* possibility admits of degrees, from "really possible" down to "barely possible" or "impossible," and is probably always directly based on some characteristics of what actually exists, so that its equivalent could be stated in terms of propositions about what is. Verifiability involves possibility in this sense. As for qualitative possibility, though the *description* of such a qualitative possibility is necessarily composed of known existents, the qualitative possibility itself is not existent in any realm. Only the description is real; nevertheless, we can and do consider such possibilities also. They are no more to be identified with "nothing" than with any existent thing; their positive character is perhaps to be found in some connection of universals. We consider qualitative possibilities always and only in *comparisons* with what is. We may mistake which is which, and that is an erroneous judgment, but not nonsense. It avails nothing to postulate the erroneous as real in some universe of fictions; our error lies in judging it real in a universe where it is not real, and its being real there can not be actualized anywhere. It is vain to try to escape the describing of the possible; and the problem of the structure of judgment is the problem how this description is existentially possible.

In the closing sections of Professor Macintosh's book, he defends the plausible thesis that the method of scientific proof can dispense with neither deduction nor induction. But in doing this, he makes what seems to me a quite unnecessary attack on the existential possibility of studying qualitative possibilities, with especial reference to sciences of the hypothetical, such as pure mathematics and logic. He finds apparently some contradiction between such a statement of fact as, "This man was a traitor," and the statement of a qualitative possibility such as, "If he had been loyal, we should have honored him as a patriot." But Professor Macintosh has a particular animus against non-Euclidean geometry and Cantor's transfinities. His zeal even outruns his discretion. Let me quote (p. 467) concerning transfinities: "But we know, by intuition capable of enduring the severest criticism, that there can be no such [infinite] collection. Other conditions remaining the same, 'adding to' involves 'increasing'; and so the definition [*i. e.*, an infinite collection is such that adding to it would not increase it], *when the meaning of its terms is considered*, is seen to be simply self-contradictory." Let me paraphrase this. "A boy can not grow tall without also growing

fat, because we know by an intuition capable of enduring the severest criticism, that it is self-contradictory for a thing to become larger without becoming bigger." What the theory of transfinite numbers says is that a collection can be increased in two distinct ways, and sometimes the usual sort of increase may occur without the other sort. But to return to the main issue: no mathematician intends to assert or deny there exist an infinity of things in the world, but he nevertheless examines the possibility. He can further compare such possibilities with one another and with what is empirically known to be actual, and he finds such comparison very illuminating. And as to whether he does thus find such comparison profitable, he is the one best able to judge. So why should we worry about it?

But for my part, and concerning possibility in general, I shall say that one of the greatest privileges of the human mind, and peculiarly of the philosophic as of the artist mind, is to be able to rise above the world as it is, and compare what is with what might have been. This is not romancing, and it is not easy, though we try it in even the simplest judgment we make. It is not receiving possibilities for their own sake, but only for comparison that we may the better understand the world as it is. It requires knowledge in its highest discriminative power, and is seldom fruitful, because of our unfortunate ignorance, in any but the abstract sciences. But the praise of such comparison is the key-note of present-day rationalism, and I am glad to call myself a rationalist in that sense.

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THE DEMOLITION OF UNREALITY

ON the negative side, man's intellectual progress has consisted in the exorcising, one after another, of superstitions; on the positive side, in the discovery of facts and of fertile conceptions. The condition of stable advance is that these two should go hand in hand, each assisting the other, we may take it that the cause of philosophy will be served by the removal of certain profitless notions as well as by the revelation of positive features of the universe. It is a task of the former or negative sort that we here address ourselves to. We shall consider an old and apparently influential notion of physics, viz., that of unreality; and we shall endeavor to attack it utterly.

This concept, I declare, is mere deception. If duly examined it will be found to be self-destructive; it takes away what it feigns and cancels itself out. In its pretentiousness it is a dead weight.

the mind, claiming attention, but delivering no information and explaining nothing. Berkeley, it has been said, demolished the conception of corporeal substance, Hegel the thing-in-itself, Kant the soul-substance, and certain modern thinkers, perhaps, the psychical content. It may be that this is not wholly true; but I do indeed claim that "unreality" displays all the reason of non-being that these categories ever appeared to do. It is the case *par excellence* of pure nothingness.

As "unreal" is the contradictory opposite of "real," let us approach our object by considering the latter notion. What then does "real" mean? Now it seems fair to say that reality is *either* the same as Being in the most general sense of that term, *or* is a certain sort of Being, a species within the genus. By Being in the most general sense, I mean something which everything possesses: everything, at least, which can be identified as an integral object of thought. So ubiquitous a property can hardly be further defined; it is practically equivalent to "presence." The King of Utopia, mermaids, wooden men, as well as the sun, moon, and stars, or you and I, all have Being in this meaning of the term. But the last five have reality, we say, which the first three have not. Accordingly, reality would seem to mean, not merely Being in the widest interpretation, but a very special kind of Being. Since it is then specific, it is something that can be defined; indeed in the opinion of most philosophers, it is their main professional task to ascertain the definition.

Now let us suppose that the definition were found. Let it read: to be real is to be $f(x)$, and not to be $f(x)$ is to be unreal, though still, in the general signification of Being, to be. As a fact, the different philosophical schools do believe themselves to have found the definition, and each fills in the $f(x)$ in its own way. To be real is to be the single whole of experience; to be real is to be a universal object; to be an independent object; to be fulfilment of a purpose; to be roughly rational; to be in the spatio-temporal world; etc.—these are some of the answers. Notice, now, that every one of them defines reality by a certain *character*; whether a quality or a relation or a system of relations. It is as if we said, "to be real is to be blue." But why should blue be more real than red? What is there about blueness, or universality, or purposiveness, or space, or time, etc., that makes them more real than partiality, or particularity, or aimlessness, or the non-spatial, etc.? If we stop to think of it, there is an absurdity lurking in *any* definition of reality. Definition is by relations and qualities, by essence rather than Being; the minute we make definitions we leave the sphere of Being and go over to that of character. But reality is a fulness of *Being*, not a character; for any

character you please may be imagined and may remain merely imaginary. I can think of a universal type, a satisfied purpose, a space-and-time world; but the question, whether there is such an entity, is to be settled only by empirical investigation. No character is enough to confer Being; *a fortiori*, no character is enough to connote that acme of Being, reality.

It is in this case as with other fundamental dualisms. You can not by multiplying universals define the individual, nor by adding individuals define the universal; you can not by adding finite quantities get the infinite, nor by dividing the infinite evolve the finite; you can not by heaping together potentialities produce something actual; you can not by adding points make up a line, nor by dividing a line reach a point; you can not draw from a static world, however complicated, the element of change, nor from change the static. I more can you, by any manipulation of characters, produce that unique thing we designate by such terms as being, existence, actuality, reality. Of all these dualisms it is true that the one member cannot approach the other; but the relation of the members, in each case one of limit to series approximating the limit.

We have spoken of reality as a fulness or acme of Being. Does not this beg the point at issue by tacitly identifying reality with one member of the pair "Being-essence" and excluding it from the other? No, we answer; for reality is by common consent a sort of Being. Even supposing it were to consist in the addition of a certain quality to Being—say blueness, for one quality is here as good as another—still that quality rather than some other would be satisfactory only because it had a certain existential flavor about it. If blueness were a mark of reality, then it would be so because blueness somehow closely allied to Being, while other attributes are not allied.

In short: if reality is a special kind of Being, rather than "Being" used in the widest sense, then reality becomes Being *plus* a certain character. But as no character is fitter than any other to be added to Being, this union is quite arbitrary. Which character is added with Being to constitute reality, will depend upon external matters. And the history of philosophy shows this. One class of thinkers held the material world to be the solidest or most important or best realm of Being, and it proceeds to define reality as material. Another class, struck with the perduring quality of the universal, defines reality as that sort of Being—and so on. But none of these attributes which is added to Being has any *intrinsic* connection with Being. We must conclude that the attempt to define reality as anything more than Being in the widest sense is doomed to

Secondly, it must be understood that the world of physics and chemistry consists exclusively of systems. This was established by Willard Gibbs, and is now one of the recognized postulates of science. Systems, in turn, are made up of phases and components; they are characterized by concentrations and by different forms of activity—especially heat and pressure. Above the sphere of the molecule and below that of the organism science knows nothing else in the world.²

Finally, a teleological conclusion, the unique ensemble of properties is uniquely favorable to the existence of systems; it favors number, diversity, and durability of systems, of their phases, components, and activities; and no other elements and compounds even remotely approach such fitness. This conclusion depends upon the evidence of a great variety of phenomena such as the stability of temperature on the earth, the rapidity of the meteorological cycle, the richness and variety of dissolved material in the ocean, the penetration of water into the soil, as well as directly upon some of the unique properties themselves, such as the chemical characteristics of the three elements, and the nature of the transformations of energy which accompany their reactions. Among all the general properties which have been investigated I can not find a single instance of unfitness for systems in general. In short the arrangement of the properties of matter among the elements is such as to make possible the production, in every respect physically intelligible, of much rather than little or of more rather than less in the course of evolution.

Such are the facts: I will add one opinion. This relationship between the properties of the three elements and the general characteristics of systems appears to be exclusively teleological; for neither of the terms of the relationship is liable to modification in time. As they now are so the elements were originally determined; and systems will be systems as long as mass is mass.

I do not doubt that Professor Warren is quite right in thinking, like every one else, that life would be different in another place. But whether it could use silicon instead of carbon, who shall say? I know, however, what chemists will guess. The fact is that life, if still possible under other conditions, would be restricted by any change that excluded water or carbonic acid from the environment, or any of their peculiar properties from the constitution of these substances and their elements.

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² *Loc. cit.*, Chapter VII. "The Functions of an Environment," *Science*, N. S., Vol. XXXIX, pages 524-527 (1914).

THE PREDICATES REAL AND UNREAL

IN the course of experience we find that the terms real and unreal are constantly applied to very diverse objects under a great variety of conditions. We say jewels, old masters, and money are real, and hallucinations are unreal. We speak in like terms of moral qualities. The sympathy manifested by an enemy is unreal, that of a friend real. Again, the recantation of a Galileo is unreal, the conversion of a Newman real. Turning to science the same distinction is found. Color is not a true representation of reality, hallucinations are not real objects. The very procedure of a discipline itself is subject to the classification of real and unreal. This was not a real test, or that was not a real experiment, are phrases frequently used to characterize work in these fields. All sorts and conditions of objects are constantly being brought under the categories.

These illustrations show that the categories "real" and "unreal" are habitually used, and hence must have some definite connotation. Nor can they be considered as equivalent to "being" and "not being." For in some sense, all the objects mentioned above *are*, no matter what their status in regard to being real is. Professor Sheldon, in the preceding paper, attempts to demolish the conception of unreality, pointing to the fact that we have relegated such ideas as substance, etc., to the sphere of outgrown superstitions. But what has actually occurred is that we have come to know what substance is in terms of experience. We have not done away with it, but learned to state what it signifies. Inasmuch as things are constantly being classed as real and unreal, the task of the philosopher consists, not in doing away with the distinction, but in determining just wherein the distinction resides.

In pursuing the task of determining what the terms mean in experience, we shall take as illustrations cases where they are used and others where they are not, and, by a method akin to induction, isolate the characteristics of the former. I go into a jeweler's shop and buy certain stones as diamonds. They are later proved to be glass. My former judgment that they were jewels has been shown to be false. Under these circumstances I pronounce the stones unreal. Yet in another sense they are real, *i. e.*, they are glass. Contrast this with the following instance. A certain chemical is presented to me for analysis. From its appearance I am inclined to believe it a calcium salt. But further testing shows that I was mistaken, and that my initial hypothesis was incorrect. But I do not on this basis judge the substance unreal. It is a compound of a different character from the one anticipated, but not unreal. Or here is another pair of illustrations. A man has an hallucination. As soon as he perceives it to be such, I

immediately declares it to be unreal. But an alienist interested in the case would pronounce it real. On the other hand, in a fog what seemed at a distance to be a man turns out to be a tree. Still the tree is not unreal, but a tree. It was quite different with the hallucination, which not being the experience of a physical object, is unreal.

When we examine these instances we note a number of points.

1. In the first place the predicates real and unreal can both be applied to the same object at the same time from different points of view, or at different times from the same point of view. The hallucination is a reality to the physician, an unreality to the patient. The stones accept both universals. It is quite clear from this that the judgments are not made, owing to the fact that the objects possess any particular properties. As hallucinations and glass, things are hallucinations and glass and that is an end of it. The nature as such of the objects is not responsible for the judgments concerning their reality. Any kind of a thing may, on occasion, be described from this viewpoint. It follows, therefore, that Professor Sheldon's statement that reality is either being as such or being of a certain kind is invalid.

2. In all the illustrations cited, some claim to a particular nature was made. The stones masqueraded as diamonds, *i. e.*, the conditions under which they were bought, certain aspects of their appearance, etc., all led to their explicit assignment to that class. The hallucination, due to its sense vividness and what not, was looked upon as having the properties of a material object, *i. e.*, as offering resistance, displaying certain kinds of activity, etc. The supposed calcium sulphate made a claim to a certain status which was at least tentatively accepted. And the tree suggested a man. In all cases, the attempt to appropriate a specific character is made by the object.

This fact would lead nowhere unless the attempt to operate on this suggested belief were made. This calls either for action on this basis or for judgments which are then submitted to the process of verification. If these work out as expected, no judgments of reality or unreality are returned, provided there has been no doubt raised as to whether the initial assumptions were correct. The stones merely continue to be accepted as diamonds, and the chemical as a certain salt. If my judgments of their character are never challenged, I shall accept them for what they seem as long as my further activity is successful. Suppose, however, that my initial hypothesis is for some reason brought into question. This may happen for diverse reasons, the mere recognition on my part of the purely tentative nature of the idea being sufficient. Further investigation shows that the stones are not diamonds, and the substance not a calcium salt. Now the falsity of my initial judgment does not lead to the declaration that the objects of them are unreal. For while we do ascribe this predicate to

the pseudo-jewels, we merely declare that the compound possesses a different nature from the one claimed. It is barium, not calcium, but no question of reality or unreality is raised. Again, had the initial statements been substantiated, the diamonds would have been real, but under like conditions the calcium would have been calcium, not real.

It follows from the above that the truth or falsity of judgments based on the claims of objects to a certain status is not as such the basis of the predication of reality or unreality. The latter concerns the subject-matter of a judgment, while truth and falsity are properties of judgments. Judgments are true or false, while things are judged real or unreal. Nor are the two factors so related that any one-to-one correspondence can be set up.

3. Though the fact that the diamonds are unable to substantiate their pretensions does not *per se* lead to their being judged unreal, still it undoubtedly has something to do with the matter. What then is needed in addition if objects whose appearance has or has not been misleading, are to be dealt with in terms of reality. Returning to our illustrations, the great difference stands out as one of value. The diamonds are interesting to me only as diamonds. As glass they can not be worn, they are not a suitable gift, they are like countless other bits of stuff which I ignore. It is only in their rôle as precious stones that they appeal; it is only their apparent character that is of value. Their failure to meet expectations renders them matters of indifference to me. Bad money is unreal because it pretended to be a medium of exchange, and since it is not such my interest in it vanishes. Another way of putting the matter is to say that only as jewels or as specie could the objects be factors in guiding my actions. As glass and lead they no longer figure in the existing situation as items in my procedure. They are simply non-existent for my plans. My interest in them may be reawakened subsequently, they may later aid my purposes, but for the situation in which they were to have played a part they have become non-entities. The same holds true in the case of the hallucination, for, short of the status of physical object, it is a matter of indifference for my present actions what it is, a product of diseased sense organs or what not. But for the alienist, that it is an hallucination is the vital matter, and the maintenance of this character in the face of additional experience makes the predicate "real" applicable. If it had been a true perception, it would have fallen outside of his province and been valueless to him. But the sodium sulphate was not judged unreal, because the interest lay in the constitution of the body, and its seeming specific character was an hypothesis, the truth of which did not exhaust the values of the stuff. If it turns out to be calcium, well and good. If it turns out to be another element, well

and good. The particular character of the reaction which would have been forthcoming had it been the former will now be changed, but in its new rôle it is still a factor in the situation. I shall alter the reagent which I was about to add, etc.

We reach, then, the following conclusion as the result of the analysis given. When a thing makes claim, however tentatively, to a certain character, and is of value only in so far as it possesses that character, the validating of this claim will lead to its being judged real, the invalidating to its being judged unreal. On the other hand, provided this particular nature is not the exclusive point of interest, the result of the further testing does not lead to the raising of the question of reality one way or the other. The truth or falsity of the initial hypothesis is not as such responsible for the application of the additional predicates. The judgments were correct or incorrect, and that is all there is to it.

Another way of putting the matter is to say that reality and unreality are evaluative terms. This has two important results. In the first place, the old problem of being as usually conceived, is meaningless. The determination of the ultimate character of reality, the accepted task of the metaphysician, is a useless quest, for reality is nothing, has no character, but is merely a generic term for the fact that in experience many things are evaluated in a certain way, that certain value judgments take place. The distinction between appearance and reality as usually stated vanishes, for they are relative terms, not absolute. On the other hand, contrary to the opinion of Professor Sheldon, unreality can not be demolished. Like substance, it can merely be defined. Unreality in any absolute sense vanishes, for it should never have existed. But that things may have the value of being unreal, as they may have the value of being good or true, is proved by every-day experience.

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TELEOLOGY IN COSMIC EVOLUTION: A REPLY TO PROFESSOR WARREN

IN a recent essay¹ Professor Howard C. Warren has touched on the problem of fitness of the environment and, while analyzing what he takes to be the logical foundation of a belief in the teleology of inorganic nature, has associated with my writings certain arguments which he easily shows to be fallacious. His principal comment is to be found in the following lines: "There is, however, a fundamental

¹ This JOURNAL, Vol. XIII., pages 65, 66.

scientific objection to this mode of reasoning. Admitting that inorganic conditions are peculiarly suitable to the maintenance of life as actually constituted, it may nevertheless be argued that under a different set of inorganic conditions a different type of organism might have arisen for which those alternative conditions would have proved just as favorable." In addition Professor Warren objects that inorganic teleology is founded on particular rather than on general facts or considerations and, further, that unfitness is never taken into account.

I can not help thinking that my critic has been hasty in supposing that any man of science, approaching this subject from the frontiers of physics and chemistry, could to-day hold such silly views. However that may be, these are not my opinions; and without entering into a profitless discussion of the responsibility for Professor Warren's misconception of my conclusions upon this subject, which may very well be either mine or his, I am anxious to point out the facts which he has overlooked, and thus summarily to make out what I conceive to be the true case for inorganic teleology.

Putting aside all vain speculations about other possible worlds in which matter may have different properties and energy different forms, we can see that in the course of cosmic evolution water and carbon dioxide have necessarily found a place on the surface of the earth. Under these circumstances the properties of the two compounds and of their three constituent elements have caused these substances to be the principal factors in both geological and organic evolution.

The first fact to be noted is that these properties make up a unique ensemble of singular physical and chemical characteristics. Thus the latent heat of vaporization of water is the highest known latent heat of vaporization, the solvent action of water the greatest of solvent actions, the capillary phenomena of aqueous systems the most extensive of capillary phenomena. Again the solubility of carbon dioxide in water is such that it is everywhere evenly distributed between the atmosphere and aqueous liquids. And again the three elements form the greatest number and variety of chemical compounds, enter into the greatest variety of chemical reactions, and involve in these the greatest transformations of energy which are known to chemistry. In establishing the uniqueness of this ensemble of properties all of the general properties of matter, not merely certain particular properties, have been considered. Particular properties have been examined only when they involve the relation of water to carbon dioxide or of one of the three elements to the others.

²See "The Fitness of the Environment," Chapters III., IV., V., and VI. New York. 1913.

Secondly, it must be understood that the world of physics and chemistry consists exclusively of systems. This was established by Willard Gibbs, and is now one of the recognized postulates of science. Systems, in turn, are made up of phases and components; they are characterized by concentrations and by different forms of activity—especially heat and pressure. Above the sphere of the molecule and below that of the organism science knows nothing else in the world.³

Finally, a teleological conclusion, the unique ensemble of properties is uniquely favorable to the existence of systems; it favors number, diversity, and durability of systems, of their phases, components, and activities; and no other elements and compounds even remotely approach such fitness. This conclusion depends upon the evidence of a great variety of phenomena such as the stability of temperature on the earth, the rapidity of the meteorological cycle, the richness and variety of dissolved material in the ocean, the penetration of water into the soil, as well as directly upon some of the unique properties themselves, such as the chemical characteristics of the three elements, and the nature of the transformations of energy which accompany their reactions. Among all the general properties which have been investigated I can not find a single instance of unfitness for systems in general. In short the arrangement of the properties of matter among the elements is such as to make possible the production, in every respect physically intelligible, of much rather than little or of more rather than less in the course of evolution.

Such are the facts: I will add one opinion. This relationship between the properties of the three elements and the general characteristics of systems appears to be exclusively teleological; for neither of the terms of the relationship is liable to modification in time. As they now are so the elements were originally determined; and systems will be systems as long as mass is mass.

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³ *Loc. cit.*, Chapter VII. "The Functions of an Environment," *Science*, N. S., Vol. XXXIX, pages 524-527 (1914).

REVIEWS AND ABSTRACTS OF LITERATURE

Hauptwerke der Philosophie in original getreuen Neudrucken. Band I.

B. BOLZANO's *Wissenschaftslehre*. Neu herausgegeben von Alois Höfler. Leipzig: Verlag von Felix Meiner, 1914. Erster Band. Pp. xvi + 571.

Bernhard Bolzano's scientific activities represented two important lines of thought, yet he obtained recognition in one only in comparatively recent years and long received but little attention in the other. As a precursor of Cantor in his "Paradoxieen des Unendlichen" and as a pioneer in doctrines more fully developed by Weierstrass, Bolzano has now attained deserved renown.¹ Not so well known, but it would appear, equally meritorious are Bolzano's investigations in logic represented by his *Wissenschaftslehre*. Latterly, this work, too, has been rescued from obscurity and made the basis of study by investigators, notably Pelágyi and Bergmann. The increasing importance which the *Wissenschaftslehre* is winning for itself, combined with the scarcity of the original treatise, has made a new edition most desirable. It is gratifying, therefore, that a reprint has been undertaken.

The *Wissenschaftslehre* bears that formal and systematic character which is traditional among European scholars. The first volume consists of an *introduction*, a *fundamental theory*, and the first part of an *elementary theory*. The introduction is concerned with the meaning of a scientific theory and the relation of logic to science. The fundamental theory develops a doctrine of the existence and knowledge of truth. The first part of the elementary theory contains a discussion of representations.

Science, according to Bolzano, is a mere complex of truths irrespective of the order of the latter. These truths do not imply a reference to the knowledge and assumption by individuals; they are not subject to change. In fact, they are non-existential in the sense that they involve no reference to space or time. Science is here taken in an objective sense, or science *itself*. The *Wissenschaftslehre* is that science usually termed logic; its task of logic is to provide rules for the analysis of truth as a whole into parts and for the exposition of each part, that is, logic is essentially a theory of scientific exposition. Bolzano suggests that logic might be called *formal* in that it deals only with expressions of the type "Some A are B," which he calls "forms" of propositions. These forms are genera of propositions and are not themselves individual, completely determined propositions; they have undetermined components such as the "A" and "B" in "Some A are B." In a subsequent note (p. 393) Bolzano specifically states that "form" is a mere (p. 247) conjunction of words or signs by means of which a certain kind of representations, propositions, and deductions may be exhibited. The general form of every² proposition (p. 380),

¹ Cf. J. T. Merz, "History of European Thought of the Nineteenth Century," Vol. II.: "Development of Mathematical Thought," page 709.

² Cf. M. Pelágyi, "Kant und Bolzano" Halle, 1902; H. Bergmann, "Die philosophische Werk Bolzanos" Halle, 1909.

³ Bolzano thus assumes that all propositions are reducible to the subject-predicate form. On this point see Russell, "Principles of Mathematics" p. 28, § 33.

example, is "A possesses B." It is clear from Bolzano's description of species and genus (§ 106) and an incidental remark concerning a complex of true propositions (p. 111) that the "form" of propositions is not a proposition, but the designation of a representation with propositions as objects. Bolzano's "form" of propositions seems to parallel⁴ Russell's *propositional function*. After considering the formal character of logic Bolzano discusses its independence from other sciences. It is maintained (p. 53) that there are few, if any, independent sciences; in particular, logic is dependent on psychology (pp. 14, 54, 227).

In the fundamental theory Bolzano distinguishes between the proposition as such, as verbal, *i. e.*, its expression by individuals and as mental, *i. e.*, its mere representation in thought. For example, "God is omnipresent" is a true verbal proposition, "a square is round" is a false proposition; but "the round square," "the omnipresent God" are not propositions, but representations (presumably of propositions; *cf.* "that which is round and square") and are neither false nor true. Bolzano remarks (p. 79) that the distinction between a proposition as such and its representation, between a thing and its concept, is necessary to avoid errors. As an illustration he cites "What I now say is false" as a false proposition whose subject is not a proposition, but a representation of a proposition. The latter proposition, he observes, is one of a class of propositions whose subject or predicate involves a reference to the propositions themselves or some one of their components (*cf.* pp. 75, 222, 265) so that a modification of their predicate induces a modification of their subject. Such propositions may have the further property that their contradictory opposite is not obtainable by prefixing "not" to their predicate; to give another illustration, "the number of words in this sentence is ten" and "the number of words in this sentence is not ten" are both false propositions. To return to Bolzano's general exposition: propositions *in themselves* are assertions (pp. 77, 115) of truth or falsehood irrespective of verbal expression or of mental representation (p. 78). Between the constituent representations in a proposition there is a relation (p. 97). Subordinate to the concept "proposition in itself" is the concept "truth in itself": all truths in themselves are propositions in themselves. By a truth in itself is meant a proposition which "asserts something as it really is." The words in this definition have a technical signification of which Bolzano believes he takes sufficient account by remarking that for a truth in itself it is undetermined whether the proposition is thought or verbally expressed (p. 115). Truths in themselves are, for example, the truths of religion, ethics, mathematics, and metaphysics (p. 113). Such truths must be carefully distinguished from known truths. Bolzano bases this distinction on the principle that two concepts may be convertible and yet distinct. Thus all truths in themselves are known by God, since God is omniscient, and are, therefore, known truths; but the concept of a known truth is distinct from the concept of a truth in itself.

⁴ Russell indeed states (*loc. cit.*, page 13) explicitly: "A propositional function is, as it were, a schematic form standing for any one of a whole class of propositions." The remarks of Bergmann (*loc. cit.*, page 87) will be found suggestive in this connection, but should be read with caution.

The distinction in question is analogous to the difference between equivalent definitions of a line in geometry or presumably the difference between cardinal and ordinal numbers in arithmetic, etc. Historically, concepts "proposition in itself" and "truth in itself" may be traced to Leibniz, among others (pp. 85, 120).

In the first part of the elementary theory Bolzano defines "representations in themselves" (cf. § 56, p. 244) and gives an elaborate classification of these concepts. "Proposition in itself" and "representation in itself" are mutually exclusive; however, part of a representation may be a proposition, and conversely representations have the (characteristic) property that they are, or may be, parts of propositions (pp. 221, 238). In particular, then, anything that may be made the subject of a proposition is a representation. Any word designates a representation in itself, and if the former is unambiguous, the latter is unique (pp. 217, 218). Bolzano's classification of representations is made first with regard to those internal qualities (*Beschaffenheiten*) or *properties* which are possessed by representations without reference to other objects and second with respect to those external qualities or *relations* of which the contrary is valid. The first basis of classification leads Bolzano to discuss simple and complex, concrete and abstract, real and imaginary representations. Representations in themselves may or may not refer to an object. The object of a representation is distinct from the latter. In illustration, Bolzano states that the representations "nothing" and "round square" have no objects; the representation "this A" in an immediate sense (§ 59) has but one object; the representation "integer lying between one and ten" has a finite number of objects and the representation "line" has an infinite number of objects. Simple representations having but one object are called *perceptions* (pp. 327, 328); representations which are not perceptions, wholly or in part, are called *conceptions* (p. 330). In § 79 a digression is made dealing with the perceptual and conceptual aspects of space and time (cf. p. 370). In general, representations having at least one object have a *domain*, which is described (pp. 297, 298) as that property of a representation possessing objects in virtue of which it represents these and no others. The domain of each representation is unique; a representation with no object (§ 67) may be said to have an empty domain. If the domain of a complex representation remains invariant when parts of the representation are removed, the representation is said to be redundant (§ 69). In close connection with the redundancy of a representation is Bolzano's (functional) conception of the variability of a representation as dependent on an independent variable, that is, the derivation of new representations from a given representation by replacing some constituent of the given representation with *arbitrary* representations (p. 314). This quasi-functional character of a representation allows Bolzano to extend (p. 311) the conception of redundancy to representations with no object, *e. g.*, imaginary representations. Thus "a round and four cornered square" might be considered redundant with reference to the constituent "four cornered" since the representation in question yields properly redundant representations by the suitable substitutions of representations for "round."

An important property of the domain of a representation is its *extension* (§§ 66, 93) which is a magnitude (cf. § 87). If a representation has a finite number of objects the extension of its domain may be determined absolutely by the individual specification (enumeration) of these objects. In the case of an infinite number of objects the extension can be determined only incompletely⁵ and relatively, that is, by comparison with the extension of other infinite domains: by specifying that the domain of the representation A has the same extension as the domain of the representation B, or the domain of A is part of the domain of B, etc. (p. 299; cf. §§ 87, 93). Here Bolzano is in touch with his "Paradoxieen des Unendlichen." In fact the extension of a domain through its underlying principle stated by Bolzano (pp. 302, 303) anticipates⁶ a standard conception of the modern theory of assemblages. The domain of a representation in its purely logical aspect, moreover, is itself of the highest importance and has been dwelt upon by recent writers, though in a manner distinctly inferior to Bolzano's exposition.

Before proceeding to the second basis of classification of representations, Bolzano describes representations of property and relation (§ 80). If a whole consisting of parts has a quality which is distinct from the quality of each part, then the quality possessed by the whole is a *relation* between the parts. The relation is, further, a function, as it were, of related variables, the latter being restricted to objects of the same kind (p. 381). Clearly, the preceding conception of relation is opposed to the view of the neo-realists such as G. E. Moore and others. However, Bolzano calls relations external qualities; and non-external or internal qualities are called properties. He distinguishes between symmetrical and unsymmetrical relations and discusses the possibility of a relation between an object and itself (p. 384). In the concluding two chapters, Bolzano compares representations first, with reference to relations between themselves, and second, with reference to their relations to other objects. Perhaps the most interesting relations discussed are those of extension (§ 93), convertibility (§ 96), inconsistency⁷ (§ 103, cf. pp. 480, 509), and opposition (§ 107). Analogous to the generalization of the concept redundancy (§ 69) Bolzano generalizes convertibility and other relations so as to apply to representations having no objects (§ 108). In § 109 (cf. § 55) a kind of correspondence between true and false propositions, and "correct" and "incorrect" representations is established.

These are the prominent features of the first volume of the *Wissenschaftslehre*. The work abounds with valuable historical references and throughout his discussion Bolzano has endeavored to illustrate his arguments with examples from elementary mathematics. Apparently Bolzano

⁵ From the above remarks of Bolzano it would seem that Russell is wrong when he says ("Principles of Mathematics," page 70) that Bolzano did not recognize the impracticability of applying enumeration to infinite systems.

⁶ Cf. the Borel-Lebesgue "measure" of an assemblage; Hobson, "Theory of Functions of a Real Variable," § 81.

⁷ Cf. Royce, *Transactions of the American Mathematical Society*, 1905, pages 359, 365, etc.

was guided to a considerable degree by mathematical conceptions, attempting to bring into logic the precision and standardization⁸ of deductive mathematics. Some of Bolzano's illustrations, however, emphasize the incompleteness of mathematical science in his time; for example, his interpretation of $\sqrt{-1}$ as an imaginary representation, on a par with a round square, presents a problem which has since been solved by the general theory of complex numbers.

It has been said that Bolzano's *Wissenschaftslehre* prepared the way for a "phenomenological" method in logic and the theory of knowledge. From this point of view, a comparison of the *Wissenschaftslehre* with Husserl's "*Logische Untersuchungen*"⁹ and Meinong's "*Gegenstandstheorie*"¹⁰ facilitates an insight into these authors. It is instructive also to study Bolzano's work in its points of contact with Russell's "*Principles of Mathematics*." Although Russell has commented on the excellence of the "*Paradoxieen des Unendlichen*" it is strange that he does not seem explicitly to mention the *Wissenschaftslehre* in his book. Much of the ingenuity shown by Russell in discussing such problems as *meaning* and *denoting*, *propositional concept* (logical subject, verbal noun, and *proposition*, *whole* and *part*, *conceptual* and *real analysis* will be found to be characteristic of Bolzano. Striking differences between the two authors are contained in their views of the relevance of psychology to logic, the nature of relation, and the theory of subject and predicate. Russell,¹¹ has compared his doctrines with those of Frege. We are enabled to infer resemblances between Frege and Bolzano by means of the interesting controversy the former author has had with Korselt in the "*Jahresbericht der Deutschen Mathematiker Vereinigung*."¹²

A few words concerning Bolzano's historical importance may be added. It is doubtful whether Bolzano is the successor of Leibniz, as has been suggested. Nevertheless, he deserves to be associated with Leibniz and also with Descartes, inasmuch as those great thinkers devoted themselves both to philosophy and mathematics without unfavorable discrimination and thus occupied a position which seems certain of a vigorous revival and promise to be of extraordinary fecundity for both disciplines.

ARTHUR R. SCHWEITZER.

CHICAGO.

What Ought I to Do? An Inquiry into the Nature and Kinds of Virtues and into the Sanctions, Aims, and Values of the Moral Life. GEORGE TRUMBULL LADD. New York: Longmans, Green and Company. 1911. Pp. 311.

This work is the second in a series of four volumes addressed rather to the larger educated public than to students of philosophy in the more restricted and technical sense. The first volume dealt with the problem

⁸ See, for instance, Bolzano, *loc. cit.*, page 509.

⁹ Cf. Vol. II., page 7; Vol. I., page 227.

¹⁰ Cf. the review by Professor Perry, this JOURNAL, Vol. XII., pages 301-302.

¹¹ *Loc. cit.*, pages vi, 501.

¹² Vol. 12 (1903), 15 (1906), 17 (1908).

of knowledge, and volumes are to follow upon the problem of faith—whether scientific, social, or religious; and in answer to a closely related problem—"What may I hope?"

At a time when moral values appear to many to be uncertain and insecure, and when a misty haze surrounds many if not most of the attempts to harmonize an acute social consciousness which has not precisely inquired as to what it means by society, with the claims of a strident individualism, we have become more modest in what we expect from such a book as this. Theoretically the volume does not throw much new light upon the problem of morals, but it has the practical value of insisting at this time upon the dignity of the individual life of virtue, as carrying with it its own sufficient value and sanction, and incidentally as the one efficient remedy for some of the evils of the day.

The first volume of the series was entitled, "What Can I Know?" The author states that the most conspicuous difference between the answer to that question and that to the question, "What ought I to do?" lies, not in the distinction between "knowing" and "doing," but rather in the distinction between "can" and "ought." Knowing is a kind of doing, and "high class, conscious doing" involves a large measure of cognitive activity. So the inquiry turns to the question of "oughtness," in which is involved conspicuously the distinction between the fact-that-is, and the idea-of-what-ought-to-be.

This distinction does not here yield the fruit which it might have yielded. The thought suggests itself that there is another great class of activity which is a kind of "doing" of a very conscious nature, and which distinguishes between a fact-that-is and an idea-of-what-might-be. In the relationship of the idea-of-what-ought-to-be of morals to the idea-of-what-might-be of creative art, if we may use the analogous term here for want of a better, there might be material for a fruitful inquiry into the nature of "oughtness."

The course of the author's inquiry leads elsewhere, however. "Oughtness" lies, not in an objective norm, but it is rather an obligation imposed from within by individual personality itself, and it is indeed one of the unique prerogatives incident to the ideal and promise of personality. The obligation to avoid certain kinds of conduct toward animals and things lies not in the things or animals, but rather in the obligation of personality to be true to its ideal of itself. The sense of moral obligation is, therefore, individual, or personal, but the content of the obligation is social in its origin. This moral instinct is, moreover, of the most important social significance "in securing a certain moral solidarity to the race." The consciousness of clash in modern society between personal and social claims upon conduct, which motivated so much of the literature of a decade just past, has enforced upon a science of conduct the necessity of attempting to find some principle in which the individual and the social claims may be harmonized. This fact is indicated in the drift of the writer's thought.

Again the parallel between the problem involved and that of artistic creation suggests itself. Obviously the idea-of-what-ought-to-be involves

the lives and fortunes and happiness of others in a way in which the ideal-of-what-might-be of the artist is not taken generally to involve them. Moreover this proposition has a corollary in the fact that the so-called artistic temperament considers itself to be free from obligation to its fellows in a way which does not accord with our usual standards. If moral personality aims to create what ought to be, what relationship has its ideal to that of the artist, and does the solution of this problem throw any light upon the deeper social significance of morals as compared with the more individualistic significance of Art?

From the inquiry into the nature of "oughtness" and its individual and social significance, the volume proceeds to treat of more practical aspects of the problem—the separate virtues, whether there be any one comprehensive, all-including virtue, etc. The practical value of an habitual regard for all that is comprehended in the ideal of a good man, and the setting of this as the commanding task of individual life—the becoming that one good man whom I, with my particular talents and opportunities, may become; this and the fact that the being good is its own sufficient reason and reward, represent the drift of the argument in its application to individual, practical problems of conduct.

A final chapter is devoted to the relation between religion and morals. It becomes continually more evident as one reads this volume that for the writer the religious aims and sanctions and the moral aims and sanctions are in the last analysis one. When he attempts to answer the question as to whether there be one only virtue it becomes plain that, for him, if the virtues may be at all summed up in one command it is, "Be ye perfect as true sons of God." However, he seems unwilling to commit himself to a conclusion that the aims and sanctions of the moral life take their social beginning in religion, and find in it the inspiration which makes it possible for them to transcend themselves and set new and higher standards. In fact he does not commit himself to any more sweeping conclusion than this, that religion strengthens and supports the sanctions of moral life, and gives eternity to the values which it establishes, more particularly in so far as they can be identified with a world ground which is moral to the core. He hesitates to hint even, though he quotes Wundt somewhat to that effect (p. 283), that the social ideal, with its religious correlate, the Kingdom of Heaven, and moral ideals in general, have their origin in the religious consciousness.

Here again we are reminded that the parallel before suggested with creative art might be suggestive. There is certainly much in the religious phenomenon in so far as we know it which raises the question as to whether or not religion creates models and ideals of conduct in the sense that for Kant genius creates concrete embodiments of beauty, from which ethics formulates, or attempts to formulate, an internally consistent system, somewhat as the philosophical critic of art formulates canons or principles of criticism as based upon the works of artistic genius.

NORMAN T. BOGGS.

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JOURNALS AND NEW BOOKS

REVUE PHILOSOPHIQUE. December, 1915. *Le Pancalisme* (pp. 481-512): A. LALANDE. - A discussion of J. M. Baldwin's "Pancalism" and its thesis of the "beautiful" as the "center of values." *La Forme et la Pensée musicales* (pp. 513-536): LIONEL DAURIAC. - The writer compares and contrasts "musical" language and thought with ordinary language and thought, but refrains from committing himself to a positive conclusion. *De la nature et de la valeur des explications* (second and final article, pp. 537-565): G. FONSEGRIVE. - Philosophical explanations have a double sort of value: "first a practical value, independent of all value of verity, and next a value just as verity." "No one can prove dialectically the ontological value of thought, but no more can any one prove its non-value without in some fashion presupposing its value." *Revue Critique*. Morton Prince, *The Unconscious*: L. DUGAS. *Notices bibliographiques*. Sturt, *The Principles of Understanding*: LIONEL DAURIAC. *Ingenieros, Criminologia*: GASTON RICHARD. *Revue des Périodiques*.

MIND. January, 1916. *Kant's View of Metaphysics* (pp. 1-24): ARCHIBALD A. BOWMAN. - Kant's denial of metaphysics is considered with respect to the critical and the pre-critical periods. The pre-critical writings, as is shown by a detailed examination of the "Dissertation" and the much debated "Lectures," do not contain a denial of metaphysics. The main point is that what appears as *metaphysics* in the pre-critical writings, reappears as the *metaphysical* in the critical period. Metaphysics is an integral part of criticism, and the criticism of the pure reason is a part of metaphysics. *The Foundations of Character* (pp. 25-41): W. R. BOYCE GIBSON. - A detailed exposition and review, largely sympathetic, of Mr. Shand's book, "The Foundations of Character." The emotion of joy and its relation to desire is singled out for special consideration, the conclusion being that joy is not intrinsically antagonistic to desire, as is held by Mr. Shand. *The Flying Arrow: An Anachronism* (pp. 42-55): PHILIP E. B. JOURDAIN. - "The first part of this article contains an attempt at an interpretation of Zeno's arguments about motion, together with a criticism of many former interpretations. The author's view is that all four arguments are directed against the belief held by most people of that time (including the Pythagoreans and Empedocles), and still always held by unsophisticated people, that lines are made up of points." *The Plot of Plato's Republic*. (I) (pp. 56-82): P. S. BURRELL. - The impression given by Mr. Lindsay in the Introduction to his translation to the "Republic" is that "there is no subject or plot" to the "Republic." The writer proceeds from the standpoint both of method and of subject-matter to a detailed analysis of the "Republic." This paper is concerned with the relation of Book I to the rest of the dialogue. Its purpose is "to raise the problem, to state the chief questions and to discuss them in a preliminary way." *Discussions: The Universal and the A Fortiori*: CHAS. A. MERCIER. *Casuality and Implication*: BERNARD BOSANQUET. *The Indetermination of Meanings*: ALFRED SIDGWICK. *Critical Notes*: Dr. Max

Brod and Dr. Felix Weltsch, *Anschauung und Begriff. Gr Systems der Begriffsbildung*: HENRY J. WATT. Émile Bo tude et Vérité: F. C. S. SCHILLER. *New Books. Philosophic Notes and News.*

Barton, Wilfred M. *Manual of Vital Function Testing Metl Interpretation.* Boston: Richard G. Badger, 1916. Pp. 2

Die Philosophie der Gegenwart. Ed. by Arnold Ruge. Volu berg: Weiss'sche Universitätsbuchhandlung, 1915. Pp. x

Gates, Arthur I. *Variations in Efficiency during the Day, Practise Effects, Sex Differences, and Correlations.* Univ. fornia Publications in Psychology. Volume 2, No. 1. B versity of California Press, 1916. Pp. 156.

Gates, Arthur I. *Diurnal Variations in Memory and Assoc versity of California Publications in Psychology.* Volu Berkeley: University of California Press, 1916. Pp. 323-

NOTES AND NEWS

IN an article by Edwin Guthrie, entitled, "The Field of JOURNAL, Volume XIII, lines 4 to 9 of the first paragraph on pa read as follows: What final authority would judge between "correctness" of Aristotle's logic which offers two contradict the laws: $x \cdot x' = 0$, $x + x' = 1$, $(x')' = x$, and a logic which v three contradictories obeying the laws: $x \cdot x' \cdot x'' = 0$, $x + (x')' = x''$, $(x'')' = x$?

A NEW magazine, *The Journal of Experimental Psycholo* added to the *Psychological Review Publications*. This journa under the editorial care of Professor John B. Watson, of Jo University, and will be issued bi-monthly.

DR. RAYMOND DODGE, profcasor of psychology in Wesleyan has been appointed by the trustees of Columbia University Kempton Adams research fellow for the academic year 1916-

PROFESSORS GILBERT MURRAY, of Oxford University, and l of the University of Chicago, will each give a series of lectur bia University Summer School in the department of classical

UNDER the retiring clause in the faculty regulations of I ford University, Dr. Lillian Jane Martin has been made profes of psychology.

DR. ALBERT BALZ has been promoted from assistant profe ciate professor of philosophy at the University of Virginia.

THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY

AND

SCIENTIFIC METHODS

JUN 23 1916

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

STRUCTURAL LEVELS IN THE SCIENTIST'S WORLD

IN dealing with the facts of nature two types of explanation are exhibited by science. In the first an event is explained by referring it to a general law of which it appears as a particular instance. Such laws are gleaned from a classification and comparison of instances, and represent generalizations that have been tested by their power to enable us to make verifiable predictions. The second type proceeds by showing us that the situation in question is a consequence of the lawful behavior of more elementary facts out of which it is constituted. That is, there is presupposed a group of general laws characterizing the behavior of certain entities which can become organized into groups constituting the facts of which an explanation is sought. An example of the first type of law is the formula of gravitation, that all matter attracts all other matter with a force proportional to the product of the masses divided by the square of the distances, for this merely serves as a generalization under which falling bodies and the motion of the planets can be subsumed as particular instances. The second type can be illustrated by the explanation of the behavior of a chemical compound through the nature and valencies of the atoms of which it is composed, or of the behavior of a mob through the natural tendencies of the individuals in it, when these tendencies are heightened or suppressed by the reactions of the individuals on each other as well as on the situation toward which the mob activities are directed.

The second type of explanation is dependent upon an analysis of the world into classes of entities which for our present purpose can be designated as levels. Thus in the present state of physical science we can distinguish four principal levels: the electronic, the atomic, the molecular, and a level consisting of aggregates of molecules, whether solid, liquid, or gaseous. Ether is not here included as a level, for at present there seems to be no fact of observation or theory that demands the hypothesis of the disintegration or disappearance of electrons, though Planck's quanta theory, with its suggestion of energy atoms, may lead us to a granular conception of the

ether and, with it, to a need of relating the electron to these granules. Until further developments have taken place along this line, while there can be little doubt that the ether concept represents something physically real, ether remains an hypothetical connecting medium by which certain types of motion are communicated from one body to another. Its inclusion or exclusion, as a level, however, would not affect the general results at which our analysis arrives.

The electronic level of entities can obviously only be understood in terms of general laws descriptive of the behavior of electrons at present. On the atomic level, however, further results are obtainable. Since Dalton, in 1801, hit upon that transformation of the atomic theory that gave it genuinely quantitative character, the study of atomic weights and their arrangement by Newlands (1863) under the "law of octaves," and the correlation of properties as periodic functions of atomic weights by Mendeleef (1869) have opened up previously unexpected fields. If properties are correlated with weight, the suggestion at least is strong that they are consequences of structure, and the evidences obtained from Crookes' fractionations of yttria (1837), the Zeeman effect (1898), Lockyer's analysis of star spectra (1900), J. J. Thompson's studies on the conductivity of gases (1904), and Soddy's interpretation of radioactivity (1909) give almost overwhelming evidence that such complexity is actually a fact. If electrons are here the constitutive element, it must be the ideal of the chemist to account for the properties of atoms as consequences of an organization or integration of the electrons by which they are constituted. Even prior to the knowledge of electrons, Crookes (1886) proposed his pendulum oscillations hypothesis concerning the mode of genesis of the atoms from an intermediate element named *protyle*, and since the recent growth of knowledge concerning the relation of electricity and matter, speculative explanations of valency and other atomic properties have begun to appear.¹ In particular, J. J. Thompson (1904) has assumed atoms composed of varying numbers of corpuscles and in forms conditioned by the demands of stability for various numbers, by means of which he suggests explanations for the recurrence of similar properties exhibited by atoms of increasing weight, the differences in their electro-chemical nature, in their valencies, and the tendency to chemical combination between the different kinds.

While the above researches must still be held to be of a somewhat speculative nature, they are nevertheless indicative of a tendency in science. Between higher levels examples could be multiplied: for example, the creation of stereo-chemistry to supplement, in cases of isomerism, the explanation of certain molecules in terms of the

¹ Cf. Freund, "Theory of Chemical Composition," Ch. XIX.

constituent atoms, and studies of the behavior of the surface molecules of liquids to explain surface tensions, capillarity, etc. Indeed, the modern chemist is already working on the basis of a pretty clearly defined concept of levels and his ideal may also be seen in physiology and in all modern biological study of the process of growth, heredity, transmission, and the like.

Each level of the physical world, above the electronic, is then to be looked upon as containing entities constituted by an integration of entities on a lower level in accordance with the lawful forms of their behavior. But it is to be noted that the consequent behavior of these aggregates is not the behavior of the elements of which they are composed: electrons do not have valency, atoms have not molecular properties, and, for the molecule, surface tension or the solid, liquid, and gaseous states are meaningless. Even when a property seems to be present on several levels, as a mutual attraction between entities, its description is markedly different in the different cases, as was the case in the now outlived "distance coefficient" physics.³

If the rise from the simplest to the most complex level is looked upon as a process taking place in time, it would appear that the world is a place where novelties, at least in the sense of facts requiring new and previously meaningless types of description, are constantly arising. To conclude that this is the sole course of events, however, is somewhat hasty, for, if we are to accept Lockyer's conclusions from the analysis of stellar spectra, it would appear that there are stars growing hotter as well as stars growing cooler, that is, stars in which the atomic elements are in the process of disintegration as well as stars in which they are being formed. In other words, it would appear that with sufficient cooling so many heavy atoms are formed that radioactive processes set in which reverse the course of development and lead to general disintegration, which must, in some manner, be reversed when the free electrons are again obtained.³ Thus a cyclic type of process would be indicated and, as this process is characteristic of each star, the change in the whole universe can perhaps best be described as maintaining a statistical identity. Carnot's principle, however, if valid without restriction, introduces further complications the discussion of which now would lead us too far afield.⁴ We are here close to the borderland of scientific speculation and must wait further knowledge to solve the problem of cosmology.

The point that concerns the philosopher primarily is the interpretation of the nature and extent of the novelty that appears at each

³ Poincaré, "The Foundations of Science," page 298.

³ Lockyer, "Inorganic Evolution."

⁴ Cf. Poincaré, *loc. cit.*, pages 303-5.

change from a lower level to a higher in specific cosmic integration. The final test of a scientific principle is the verifying prediction that can be made by it and, while the present state of our knowledge leaves far too many gaps, there seems to be a body of ever-increasing evidence that, given knowledge of the laws of behavior of the entities on any one level, it is possible to predict the character and behavior of entities on the next higher level that are constituted by an integration of the elements of the lower level.

If our evidence was merely in the physical sciences, however, it would not be so cogent, for it could be argued that, inasmuch as knowledge of the lower levels is obtained from analysis of the higher, there must, *a priori*, be introduced among the properties of entities on a lower level all of those characteristics which would be necessary to account for properties found in the higher. But, fortunately, the principle of levels is not limited merely to the physical world. The "multi-molecule" of the physiological chemist, the protobion of the biologist, together with his cell, organism, and multi-organism represent similar structure, and these things are not, for the most part, entities, knowledge of which is derived from the study of the wholes which they constitute, but entities, the knowledge of which is attained from direct contactual study.

If it were to be assumed—a thing which seems contrary to probability as our knowledge now stands⁶—that the physical universe consisted solely of free electrons, it is theoretically possible that the evolution of matter, plants, and animals might have been predicted but it would be a mistake, of a type to which philosophers are often too prone, to assume that therefore the laws of electronic action are the supreme laws of the universe in terms of which all its happenings should eventually be construed, for such prediction would have to take the form of predicting first the integration of electrons into atoms and the consequent laws of atomic action, then the integration of atoms into molecules and their consequent properties, etc., and at every step the new types of law appearing would be as genuine and as profoundly of cosmic significance as the fundamental laws from which a start was made. Atoms do possess affinity, mass, gravitate, and men love just as truly as if these acts were not solvable into consequences of their several structural characteristics. To make any one of these things supreme is merely to indicate an interest, historical, logical, esthetic, moral, or the like, and so, perhaps, to record a fact of one's personality concerning which the affairs of the universe, as a whole, are sublimely indifferent.

In so far as descriptive characteristics are concerned, then, f

⁶ Moore, "Origin and Nature of Life," page 129.

⁷ Cf. Lockyer, *loc. cit.*

the point of view of simpler levels, each more complex one presents genuine novelties, but novelties rationally connected with them inasmuch as they are predictable consequences of their laws. They are novelties, however, because no genuine whole is merely the sum of its parts, but is a consequence of the integration of its parts, and such integration is not, in general, expressible entirely in terms of the parts and their relations. Because picking a pocket involves movements of physical masses at varying velocities and therefore could be studied from the point of view of mechanics, and chemical and organic processes that might make it of interest to the chemist or the physiologist, it does not follow that it is not also a real fact for the student of human conduct from a social point of view and that for him it may not constitute an event the significance of which can not be expressed in terms of the sciences previously mentioned. Also the reaction of any integrated group or whole to any other such group is something quite different from the reactions of any of their constituents to each other or from any fact that can be expressed in terms of such reactions.

If, then, one were to give a classification of sciences from a philosophic point of view, it would be necessary to abandon the accidental divisions that have their origin in the "sports" of history. There would be, in the first place, a group of sciences each of which should concern itself with the descriptive laws of entities on each level of integration, and each such science, if ideally developed, should be able to show how its entities could become integrated into those of the next higher level of complexity and furnish the explanation of the laws discoverable on that level. To these would be added a methodological science, or formal logic, which should abstract from concretely discovered relations the types of those relations and by developing these abstractions furnish a useful instrument for the study of the concrete facts from which they are derived. We have such a logic in mathematics, and, under the special form of "pure mathematics," a still further refinement in which abstraction leads us beyond the limitations of physical fact so that the earlier form of mathematics becomes for it an object of study which it can aid in developing, and beside the facts of nature, it also includes such facts of concept relations as are expressible in the algebra of logic. It is hardly necessary to recall the value of such sciences to the physicist and if, as yet, they seem to have done little for social science, it may be either because the fundamental laws of social sciences are not yet sufficiently clearly grasped, or because the complexity of social facts is such that a calculus would be too complex to be convenient, or most probably, because man's place in nature is such that the concrete actuality has for him an importance that makes impracticable the

neglect of detail that everywhere enters into the physicist's generalizations. In calculating the trajectory of a shell from a gun, it may not be important to note that every particle of matter in the universe attracts every other particle, if it does, with a force proportionate to the product of the masses and the square of the distance, but it does not follow that a similar simplification is possible in studying human conduct. H. G. Wells says somewhere, that if we could take men by the ten million they would be as alike as atoms, and if we could take atoms individually they would be as different as our uncles and cousins—a suggestion gaining support through recent investigations—but our place in nature makes the one generalization of supreme importance and the other of no value at all.

One further comment should also be added concerning the methodological science. Although its fundamental facts are concrete relations, the results of generalizing them do not imply physical structure corresponding, unless the group of premises are together concretely verifiable in fact. It is perfectly possible to state a mathematical physics that should have no meaning in any world in which man has ever lived. Neglect of this fact has precipitated philosophers into that meaningless dialectic of infinity which has made the cosmologies for the most part valueless budgets of paradoxes. An infinity of concrete entities has never been found by any man and from the nature of the concept of infinity, we can say *a priori* that infinity never can be. The extent of space or time is an empirical question that can only be answered, if at all, by observational and not by theoretical methods. In other words, mathematics can only extend our knowledge of nature by elaborating relations already observed, and so leading us to new observations and verifications, but can not give any guarantee that its abstractly formed structures shall have a factual counterpart when the elements for its syntheses are "freely chosen."

Scientists must get their results as best they can, and in suggesting the above principle for the classification of sciences it is not meant to introduce a revolutionary nomenclature that might possibly be more confusing than helpful. The specializations of physical sciences conform fairly well to the principle enunciated. The study of electricity is primarily concerned with electronic phenomena; the chemist concerns himself with atoms and molecules; and the physicist with integrated groups of molecules. In biology, too, our leading idea is found. Colloidal substances give rise to unicellular organisms, from these multicellular organisms develop, and the concept of the multi-organism seems to be making its way.

In psychology and the social sciences, however, the situation is not satisfactory. There is a place for the study of the laws of t

behavior of organisms and multi-organisms and the explanation of their laws through the laws of their constituent elements. Such a science would do for the animate world what physics does for the inanimate and might be called organic physics as parallel to the inorganic physics now familiar. Behaviorist psychology is the branch of this science that restricts itself to animal, including human, behavior, as plant physiology nearly covers the remaining field of this physics of the animate. The study of the human being as a special object here has for us peculiar importance and immediacy, and the introspectionist psychology tries to introduce consciousness as a new level of entity, but is in constant confusion because the behavior which should be explained through the nature of this entity is constantly getting explained by organic conditions and the entity is forced into the unique position of being constituted by nothing and explaining nothing until it becomes described as a "double aspect" or "epiphenomenon" and neglected as much as possible in all practical work. The difficulty lies fundamentally in ignoring the nature of levels, for these conscious entities are really nothing but integrations of physical states and organic processes.⁷ Behavioristic psychology is winning the field not so much through a dialectic refutation of the claims of the introspectionists as through a progressive solution of problems that remained for it insoluble. A grin without the cat may be interesting, but it is much more interesting if the actual cat laughs when tickled.

When we come to the social sciences the situation is also confused. There are integrated groups of men, as well as animals, that react on each other and on their environment as a new order of entities and require the independent statement of their laws as such. But just as the behavior of the atoms within a molecule is not the behavior of free atoms, so the behavior of men in such groups is not the behavior of men outside of those groups. The behavior of the constituent elements is, however, expressible in terms of the laws of those elements, while the behavior of the group is not. No one would attempt to express the properties of a molecule by the same laws that describe the behavior of atoms, yet in social science there are frequent attempts made to express the character of group action in terms of psychological law, or the laws of the action of the individuals out of which the group is constituted, and, I believe, a clear consciousness of the difference involved might clear the way for progress. Our place in nature, however, suggests that the study of individuals as restricted by participation in group entities may be vastly more important than the

⁷ Professor Holt in "The Freudian Wish," Ch. II, seems to be the only psychologist to have grasped the fact that new entities can be constituted through the "integration" of simpler ones.

studies of the groups themselves, that is, the materials for the explanation of the group laws may be at least as important as the laws of the group that are explained.

A further division of psychology and social science is also suggested by a certain peculiarity in human behavior. If the rationality of man means that "the development of his nervous system holds his responses in check so that when he does act, he acts as a creature who has had experience and profited by it,"⁸ rationality of conduct implies a new study in which ideas as ideals furnish the subject-matter. Human behavior is then studied, not merely for the sake of knowing what it is, but what it ought to be and the so-called normative sciences are born. Thus through perspective we find the study of facts nearest to us leads to significant subdivisions of certain levels that are not paralleled in dealing with physical phenomena that are practically more remote.

If we return for a moment to view in its totality the world as conceived by the scientists, we may note that the cardinal fact everywhere is that entities which have become integrated into groups exhibit, as group-entities, new behavior types not elsewhere found. Limitation to biological science seems here to have led M. Bergson and the neo-vitalists astray, for in biology by itself, the fact of levels would appear like a unique happening that, if really unique, would plausibly suggest such mystical forces as the *élan vital*, while seen in the light of other sciences it suggests merely the cardinal fact of naturalistic science. Also the biological conception of evolution is misleading when generalized, for it indicates a one-directional cosmic process building ever toward higher and more complex forms, while in the light of the other sciences it appears as the highly specialized process resultant upon the formation of certain colloidal states of matter and dependent both for its beginning and its close upon the maintenance of such colloids in a proper environment. Inorganic evolution, however, draws no such simple picture, for it, if we are to believe Lockyer, is always accompanied by a devolution for which there is no parallel in the organic world. Instead of the majestic sweep with which Bergson delights our fancy, a truer picture might represent evolution as the history of the formation and life of a bubble on a seething cauldron to the substance of which it must return as new bubbles take its place, and whether or no there is a definite result of the whole boiling is as impossible to predict as it would be to write a man's whole biography from observations made while walking past him on the street. Nor can we find a solution through dialectic, inner need, or intuition. Mill has taught us the futility of dialectic.

⁸ Woodbridge, "The Discovery of the Mind," *Columbia University Quarterly*, December, 1912.

give us knowledge of physical fact; experience shows a world cold and inner needs, and no intuition can enable us to reconstruct a picture from a shred of the canvas. A "*meditatio generationis futuris*," however, can only be fruitful close to the range of scientific prediction, minute as compared with cosmic processes, but sufficient to establish a healthy, active morality, though lacking that sanction of an all-embracing cosmos so ardently sought in morbid or self-doubting civilizations.

It may be replied, however, as philosophers have often claimed, that the scientific world is not the real world, but to examine this assertion requires a study of the concrete significance of scientific concepts. That study is too difficult to be undertaken in this paper, but will soon follow.

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PERCEPTION AND THINKING

DESCARTES, in the early and somewhat neglected treatise, "Rules for the Direction of the Mind" formulates the problem of knowledge in the following manner. "Now no more useful inquiry can be proposed than that which seeks to determine the nature and the scope of human knowledge . . . , we first of all divide the whole problem relative to it into two parts; for it ought either to relate to those who are capable of knowledge, or to the things themselves which are to be known; and these two factors we discuss separately."¹ Again, in the matter of cognition of facts two things alone have to be considered, ourselves who know and the objects themselves which are to be known."² In these two passages we observe the formulation of the most significant contrast in the domain of modern philosophical analysis. It is a contrast, expressible in many ways, between the knower and the known, between consciousness and its object, between the subjective and the objective, between mind and matter, between man and nature. In our traditional language we say that Descartes is a dualist. This dualism, stated here as a distinction between the knower and the known, and elsewhere emphasized as a dualism of mind and matter, is ultimately reduced by Descartes to a dualism of mechanism and teleology. An empirical observation reveals two entirely different kinds of activity, mechan-

¹ "The Philosophical Writings of Descartes," Eng. tr., Haldane and Ross, Vol. I., pages 26-27.

² *Ibid.*, page 35.

ical and purposeful.³ Thus, in distinguishing human beings from automata, Descartes says: "And the second difference is, that although machines can perform certain things as well as or perhaps better than any of us can do, they infallibly fall short in other things by the which means we may discover that they did not act from knowledge, but only from the disposition of their organs. For where reason is a universal instrument which can serve for all contingencies, these organs have need of some special adaptation for every particular action. From this it follows that it is morally impossible that there should be sufficient diversity in any machine to allow it to act in all the events of life in the same way as our reason causes us to act."⁴ Descartes segregates the mechanical and calls it matter and the teleological and terms it mind. The enlightening thing, however, is not the contrast between two realms of existence, but the distinction between two kinds of activity. But subsequent analysis emphasized the existence contrast, the subject-object, the mind-matter relation. Teleology could not long maintain itself in the face of Newtonian physics.

If we turn from Descartes to Plato we observe a very different contrast. Consciousness as something outside of nature and in contrast to it is a conception totally foreign to the Greek mind. The distinction between the subjective and the objective was unknown among the Greeks. For Plato the contrast is between two methods of having experience, perception and thinking. On the side of perception we have the particular, the changing, the imperfect, opinion, becoming. On the side of thinking we have the universal, the unchanging, the perfect, knowledge, being. Plato is essentially a moral philosopher, and under the constraint of ethical, mystical, and esthetic interests goes on to correlate perception with appearance and thinking with reality.

In both Plato and Descartes there is a dualism, a dualism which in response to widely different interests, is subjected to different metaphysical interpretations. But at bottom it seems to me that the empirical distinction of each is an impressive way of describing the same fundamental fact, the fact that perception and thinking, mechanism and teleology, mark a significant, perhaps the most significant of all, metaphysical distinction. It is my purpose in this paper to describe perception and thinking, emphasizing the contrast between them, and to note certain philosophical bearings of the distinction.

By perception I mean what Plato means by it, namely, sensation.

³ For this interpretation of Descartes I am indebted to Professor Woodbridge, though I have, by a careful reading of Descartes, satisfied myself of its truth.

⁴ Ross and Haldane translation, Vol. I., page 116.

experience. And for Plato perception is non-cognitive. There is a significant passage in the seventh book of the "Republic" which is worth noting. "*I mean to say that objects of sense are of two kinds: some of them do not excite thought because the sense is an adequate judge of them; while in the case of other objects there is a mistrust of the senses which only stimulates inquiry.*"⁵ As an illustration he takes the case of the three fingers—a little finger, a second finger, and a middle finger. "*Each of them appears a finger, whether seen in the middle or at the extremity, whether white or black, or thick or thin—that makes no difference; a finger is a finger all the same. And in these cases the question, what is a finger? is not presented to the ordinary mind; for the sight never intimates to the soul that a finger is other than a finger.*" But as soon as some problem is suggested as, for example, the greatness or smallness of the finger, then "*in these perplexities the soul naturally summons to her aid calculation and intelligence. . . .*" "*For if absolute unity be perceived by the sight or any other sense, then, as we were saying in the case of the fingers, there will be nothing to attract toward being; but when there is some contradiction always present, and one is the reverse of one and involves the conception of plurality, then thought begins to be aroused within, and the soul perplexed, and wanting to arrive at a decision asks, 'What is absolute unity?'*" Such is Plato's contrast between perception and thinking. It is interesting to read the entire passage with Professor Dewey's analysis of reflective thinking in mind. Sense experience is, for Plato, non-cognitive. Knowledge involves a situation of conflict and the conception of plurality.

Modern philosophy has given a very different view of perception. Owing to the consciousness-object relation, a contrast in terms of which the problem of knowledge is set, perception is viewed as a cognitive act. The mind, according to Descartes, is essentially a thinking thing. Consequently, perception as well as every other act of interaction with an object, must contain an element of consciousness. Perception *must* be cognitive because the mind is so defined that it could not be anything else. But with Plato there is no initial and overawing definition of mind with which an account of sense experience must conform; there are no alliances with a mind-object hypothesis. The approach is more direct, empirical, and natural. May we not return to the simpler standpoint of Plato and describe perception apart from modern epistemological entanglements?

Sense experience is limited, confined, bound down to the given, the present, the immediate. I can have no sense experience of the absent, the distant, the transcendent. To say that perception is concerned with the immediate is to say that it does not admit of dis-

⁵ I quote from Jowett's translation.

tinctions. The content perceived is a unit, an undivided whole. To introduce distinctions is to depart from the given. We may express the same thing by saying that perception operates with particulars. Reality in the form of particulars means a world of pure immediacy. In such a world there may be movement, passage from part to part; there may be activity of the impulsive and instinctive kind; there may be feeling, emotion, living; there may be efficiency and alertness, but thinking, intelligence, reflection, consciousness, there is not. Perception, furthermore, is mechanical in its operation. There is adjustment of part to part, spatial and temporal continuity, invariable and uniform activity. There are no inductive "leaps," no "final" cause, no bridging of gaps, no far-glancing sweeps. Perception is activity tied to a particular, or what is the same thing, activity concerned with the immediate.

Thinking is entirely different from perception, as much so as, in the dualism of Descartes, mind is from matter. The central factor in all thinking is suggestion, implication.⁶ Every thought, every idea, every act of consciousness, is an inference. Inference is derived from the Latin, *ferre*, to carry; induction from *ducere*, to lead. The essential element of movement, implied in each word, is present in every inference. Spatially it is a transportation from here to there, temporally it is a transition from now to then. An inference is a sweep, a span, a leap; it involves movement and multiplicity. To think means to analyze, to discriminate, to set one thing over against another, to introduce distinctions. That is to say you can not think about one thing, you can not be conscious of unity. Concentration is not thought reduced to unity, but thought maintained by novelty, variety, change, movement.

As perception is concerned with the immediate, so thinking involves transcendence. Implication means detachment from particulars, a freedom to roam beyond the immediate, a peering over the edge of the given, a break in physical continuity. Examine the words which contain the faintest cognitive connotation, as, for example, "vague impression," "hint," "guess," "conjecture," and you will note that they operate in a situation involving detachment from immediacy. And so for the more highly cognitive terms: "supposition," "assumption," "hypothesis," "theory"; they have meaning only as tentative explanations of situations where the explanation is not present in the same sense in which the situation is present. If the answer were present in the same way in which the question were present there would be no question. Neither would there be thinking, there would be only perception. Transcendence

⁶ I do not pretend to say anything here which Mr. Dewey has not said or implied in "How We Think."

means the given radiating significant leadings, the present tingling with a sense of futurity. Over the given rises a mist of meaning, enveloping spheres of influence surround it.

This is more than mechanism. In a mechanical world nothing novel can occur. Contingency and risk are out of the question. Tied to a particular, one is safe; no "accident" can happen. But mechanism is monotonous. Teleology enters to make room for sport. One part of experience plays into the hands of another part, it suggests, it implies, it tells. The crux of teleology is transcendent implication, activity in the light of ends, the operation of "final" causes. For mechanism contingency is eliminated, causality is the ruling category. For teleology, chance and not necessity is supreme. Reality as contingent implies the objective existence and reality of time. Aristotle was right in pointing out that if time were not real there would be no such thing as potentiality, there would be only actuality. It is the objective reality of time which makes teleology possible.

Now the specific differentia of every act of thought is a time quality. We do not mean this in the sense that an act of thought occupies time, but in the sense that an act of thought involves time transcendence. Reflection means acting in the light of consequences. The absent and future are operative *as if* they were present. Time is just as much an objective quality of an object as its color or taste. When I react to its color or taste I perceive it, when I react to its time aspect I think it. And this is what we mean when we say that thinking is teleological and contrast it with perception which we say is mechanical.

If all thinking involves transcendence, a working loose from particulars, how is such activity to be conceived? What gives one the right to go beyond the immediate? what supports me when I make the leap? In short, what is the basis of induction?

In the "Phaedo" Plato makes the doctrine of "recollection" the basis of induction. I see Cebes, and he reminds me of, suggests, implies Simmias. It is because they both "participate" in a "form" that I can get over from the one to the other. "Forms" for Plato are objective and real, and serve as a metaphysical basis for logical theory.

In modern philosophy the problem is solved quite differently. Hume, for example, believing all reality to be in the form of particulars, rightly on this assumption reduces all induction to enumeration. Kant, on the other hand, like Plato has recourse to "forms," but they are subjective, they are mental concepts, categories. The mind is endowed with a conceptual apparatus which enables it to perform inductive leaps of thought. The mind by definition is just the kind of thing which can turn the trick. But such a procedure,

a sort of "vicious" *animism*, is, I think, a consequence of the mind-object relation. Induction must go beyond enumeration, that is, must transcend particulars. But the object side of the relation is in the form of particulars. Descartes had riveted that conception of philosophy by saying that matter was mechanical. On this assumption the basis of induction can not be objective, at least not an induction which claims to be more than enumeration. Hume had shown that. Kant, therefore, turns to the mind side of the relation and makes the basis of induction subjective. Plato's doctrine of "recollection" may be a figure of speech, but I think it is less metaphorical than Kant's epistemological machinery designed and diagrammed after the pattern of Newtonian physics. It is still mechanism in disguise.

The fact of intelligence demonstrates the existence, in some sense, of universals. In a world of particulars neither induction nor thinking, neither consciousness nor reflection could ever arise. No wonder Gorgias ended in nihilism! If perception were the only means of experience, I could not *know* anything, and even if I did know I could never *communicate* it. Intelligibility and communication imply more than perception, particulars, and mechanism. Reflection means the operation of more influences than are discoverable in the present elements in any given situation. The moment one portion of experience attains a "value," it acquires a superiority in virtue of which it becomes regulating and controlling. Particulars become weighted; they have a representative value; they become signs. They are no longer points, they are spheres of influence. To apply a general concept to a particular situation is to import into that situation a borrowed efficiency.

The fact of intelligence demonstrates the existence in some sense of universals. It implies, too, the fact of teleology and the objective existence of time. May we not say that time is a universal? The cardinal metaphysical problem of the relation of the universal to the particular would then become the problem of the relation of teleology to mechanism, of time as one aspect of reality to its other aspect. Many of the logical difficulties which have arisen in connection with the treatment of time have, I dare say, resulted from the attempt to represent time as a particular. Predicates have been applied to time which are applicable to particulars, but which become meaningless when applied to universals. So, then, to say that thinking involves transcendence, or that it operates with universals, or that it is teleological, or that it is a reaction to the time quality of reality, is to say one and the same thing.

Briefly to summarize, we have on the one side perception, the particular, unity, mechanism, action. On the other we have think-

ing, the universal, multiplicity, teleology, consciousness. This dualism, as I maintain, is absolute. Two crucial cases present themselves for discussion. First, all thinking involves multiplicity; second, all perception is non-cognitive.

To say that all thinking involves multiplicity and movement is to say that *there is no such thing as static awareness*. By *static awareness* I mean "mere presentation," "simple apprehension," "intuition." The view that there exist such simple acts of cognition where the object is unity and the act void of movement goes back doubtless to Descartes. In the "Rules" he enumerates intuition and deduction as the two cognitive operations and distinguishes them on the basis of rest and movement, or what amounts to the same thing, simplicity and complexity. "Hence we distinguish this mental intuition from deduction by the fact that into the conception of the latter there enters a certain movement or succession, into that of the former there does not."⁷ Intuition is just static staring. This view was inevitable for Descartes. Having made the whole nature of mind to consist in thinking, then consciousness must be present in every act and form of experience, the simplest as well as the most complex. Now I maintain that what Descartes terms "intuition" simply does not exist. All thinking is what he describes as "deduction."

In support of this contention I point to the fact that, as we are frequently told, a logical "term" is an abstraction, that the simplest act of thought is an inference, a judgment. By saying that unity can not be an object of thought, I do not mean that one can not think about unity. I mean to say that attention, concentrated on one-ness in a single static act of awareness, with no going beyond, with no distinctions nor comparisons, is impossible. So long as I am concerned with just a term, I am tied to a particular, I am engulfed in immediacy, I am just perceiving. There is no awareness there. Wherever there is consciousness, there is movement, vibration, some tremor, however faint. Experience reduced to unity becomes absorption; I am one with the object as the wheels are one with the machine. In the appreciation of music, music does not move me, but as expressed by Santayana, I move with the music. It may be said that I do not draw the distinction between consciousness and self-consciousness. In reply I can only say that such a distinction seems to me to be meaningless. It is as if I were to say that there is a conscious consciousness and an unconscious consciousness.

I point also to the fact that, in the absolutistic analysis, consciousness is denied to the Absolute. No movement from the given to the not-given is possible because, as we are told, the Absolute is the All-Given. It is an eye which can see all things at once; that is, it can

⁷ Ross and Haldane translation, page 8.

perceive, but it can not be conscious. Distinctions are obliterated, and distinctions are the marks of reflection. Static such an experience is to be sure, but not conscious. The Absolute is in the highest sense an "Individual," it is a unit. The Whole can not go beyond itself, because there is no beyond to go to. So far as consciousness and unity or consciousness and multiplicity are concerned, the logic of the case seems to me to be the same whether it is applied to the Absolute or to human experience. It is not here a question of *what* consciousness is, but *where* it is. It is not to be found where there are no temporal distinctions, where there is no movement. It is not to be found where experience is concerned with unity. Reality in the form of particulars would be a world where consciousness could never appear.

We maintain that all thinking is conversant with multiplicity and movement, and that is to say that there is no such thing as static awareness. Our second crucial point is that perception is non-cognitive, that it has no affiliations with a theory of knowledge. Perception occurs at a level below cognition. In Descartes's language, it is the interaction of matter with matter. The baby in seeing is all eyes. In listening to music, so far as the experience is purely emotional, I am all ears. I do not distinguish myself from the music; I do not *know* that "I" am hearing music. I and the music are one. The immediate does not admit of distinctions, not even the subject-object contrast in its simplest form of the self and the not-self.

Modern psychology teaches that a "pure" sensation is an abstraction. Is not this, it may be asked, sufficient evidence against my view that perception is non-cognitive? In reply I should admit that a pure sensation is an abstraction *for knowledge* or *for consciousness*. And this, I may urge, is only another way of saying that the immediate is never an object of thought, that wherever there is consciousness there is a going beyond the given sense experience. We agree that pure sensations are abstractions for thought; our entire foregoing analysis has been intended to show just that. The recovery of the immediate is impossible for thought, for when the immediate is regained, thought is no longer there; or, if thought is there, it is no longer the immediate, for the entry of thought means the transcendence of the immediate. But from this to conclude that pure sensations do not exist is an unwarranted conclusion. To draw such an inference is the outcome, I think, of the assumption that all experience is in the interest of knowledge, an assumption going back perhaps to the knower-known contrast of Descartes. Since the knower is essentially a thinking being, some element of consciousness is present in every interaction between the knower and the known. Idealism makes consciousness an integral, and not to be disassociated, part of perception. Consciousness and perception are inseparable.

ably united because the mind-object relation makes any other view impossible. What I do not understand is how idealism can maintain its thesis and admit the existence of instinctive and impulsive activity. Of course panpsychism is one way out, but that again is to introduce the conception of an unconscious consciousness, a conception which is to me unintelligible. For idealism, in virtue of its initial assumption, consciousness and perception are so closely united that it would require a miracle to separate them. In the light of my contention the two are so different that it would require a miracle to unite them. Sensations may and most frequently do, in adult life perhaps always do, occur along with consciousness, *but the consciousness is no part of the sensation*. "Beauty is its own excuse for being," consciousness does not make it. On the level of sense experience I may perceive beauty; and then too I may be conscious of it, but when I am conscious of it I have departed from the immediately given sense experience: interpretation, the introduction of distinctions, transcendence, have then entered. Perception, we conclude, operates in the interest of action and adjustment and has no affiliations with a theory of knowledge. Its mode of procedure is mechanical, its sphere of operation is the immediate, and neither mechanism nor immediacy admit of interpretation. In a world of pure immediacy, living, but not a life, being, but not thinking, acting, but not personality, are possible.

In the foregoing analysis we have proceeded, not from the standpoint of types of existence, but from the standpoint of kinds of activity. And activity, as we have noted, is of two sorts, mechanical and teleological. In Supplement XXII. of the "Critique of Pure Reason" Kant says: "It is something very remarkable that we can not understand the possibility of anything from the category alone, but must always have an intuition in order to exhibit by it the objective reality of the pure concept of the understanding." As I read the Supplement it seems to imply the recognition on the part of Kant that, although the mind be endowed with its cognitive forms, reality must still be the kind of a thing which fits the forms. It is equivalent to saying that, after all, the forms are objectively real. This would mean, in terms of our own analysis, that intelligence could never arise in a world which was not intelligible. That is to say, mechanism and teleology are not just forms of human experience, they are predicates of reality. Reality is itself *both* mechanical *and* teleological.

Perception and thinking are also types of activity. What is needed is a differentia whereby we may distinguish them. I think we discover this differentia in the presence of a time element in some and not in other reactions. Reactions to the immediate we call perception, reactions to the time quality of reality we call thinking. Or

what is the same thing, when I react to the mechanical aspect of existence I am perceiving, when I react to its teleological aspect I am thinking. And thus we come to contrast perception with thinking, the particular with the universal, the given with the implied, unity with multiplicity, immediacy with transcendence, mechanism with teleology.

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VON BECHTEREW¹ AND UEBERTRAGUNG

THE conventional child having been burnt by the candle flame does not again grasp it, but draws his hand away therefrom. He reacts not to the immediate stimulus, but to an experience which is in him associated with that stimulus. If one's finger has been withdrawn on the prick of a needle, the touch of a blunt object may produce withdrawal. A response primarily elicited by one class of objects becomes elicited by another class of objects associated with the first. In the Russian laboratories, this process has been studied in other varieties of response. The first variety concerns reactions that are not under voluntary control, like the salivary reflex. This is elicited by sour stimuli. If now one combines a certain (secondary) external stimulus often enough with the sour one, after a time the secondary stimulus alone will elicit the salivary reaction. The next variety concerns reflex responses of muscles which are also not under voluntary control. Thus if one combines electric stimulation of the sole of the foot with a color stimulus, after a time the color stimulus alone elicits the reaction in the foot primarily associated with the electrical stimulus. The third variety concerns reactions which are not reflex movements, but are conventionalized responses to the primary stimulus. For example, a finger movement is employed as the response to a given light stimulus. If a sound stimulus is combined with the light, the subject will after a time react to the sound alone, "and be sure that the light was seen." If the subject responds to a given sound with finger flexion, and this stimulus is then combined with a light stimulus, the light stimuli will elicit the finger movement after the sound stimuli are stopped. Indeed, it is reported that the light stimuli need not have been given simultaneously with the sound stimuli at all, if only the lights follow the rhythm of the sound stimuli. As von Bechterew generalizes the principle,

¹ Based on the data in the "Objektive Psychologie." Cf. also Watson, "The Place of the Conditioned Reflex in Psychology," *Psych. Rev.*, 23, 1916, pages 89-116.

"If we apply to man or animal two stimuli simultaneously, of which stimuli one elicits a common reflex response, the other not, then after a number of these associated stimuli, the reaction ensues also upon the second stimulus, which in the beginning was ineffectual; such a reaction we call an associative reflex" (*Assoziationsreflex*) (p. 151).

But the process apparently operates in habitual responses as well as in reflex ones.

All the above motor responses can be objectively studied and more or less well registered and measured. A similar process operates in a fourth variety of responses, the emotional reactions, which are not so amenable to objective study, and make a less direct appeal to the laboratory worker. But von Bechterew touches on them at various points in his work. A man who has noticed an evil smell at a street-corner will have a feeling of unpleasantness when he passes there again, although the smell itself is no more. The unpleasantness recurs in situations that are in any way associated with the primary stimulus.

Just so do we have fright or anxiety at many indifferent tidings, not because the tidings themselves affright us, but because they reproduce traces² of experiences associated with them, which point to possibly unfavorable consequences for us. Here is especially revealed the associative and reproductive activity of the higher nervous centers, determining the reaction with all the characteristics of a reflex process (p. 282).

These words are like the final strokes that clear away the last separation between two parties tunneling a hill. At this point, the conceptions of affective transference, *Übertragung*, strike hands with those of the conditioned reflex.

When von Bechterew speaks of "inner reflexes, like pain, sorrow, worry, longing," he takes the same view of affective reactions which the psychopathologist has found the most helpful; conceiving them as a class of mental processes associated to ideas and perceptions by the same principles of association that bind ideas and perceptions to the motor discharges of involuntary behavior. Affective transference, by which the affect originally attaching to some special experience, is loaded upon another perception or idea somehow associated with that original experience, is "put on the map" of physiological psychology as a phase of the conditioned or associative reaction.

The transference of affective reactions seems to have two points of difference from the other phases of associative response. There is not the same need for intimate association of the primary and secondary experiences; it is more easily established. Again, the secondary, or transferred reaction, as compared with the primary

² Prince's *neurograms*? F. L. W.

one, may be more intense in the affective phase than in the other phases of associative response. There may be a "siphoning of affect" from the primary to the secondary experience so that the primary experience becomes indifferent, and nearly all its affect now attaches to the secondary experience. The most pervasive example of this in human development is that the pleasurable affects which are in early life diffused among epidermal, excretory, and other satisfactions, later siphon over to, and become centered upon, other activities to form the sexual trends. The observations of affective transference point to a considerable mobility of these "springs of action" in human life. Life makes a continual series of affective transferences, and their proper control in the development of the individual is a part of training whose import at least equals the entire discipline of artificial information.

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REVIEWS AND ABSTRACTS OF LITERATURE

Genetic Theory of Reality, Being the outcome of Genetic Logic as issued in the Esthetic Theory of Reality called Pancelism. JAMES MARSHALL BALDWIN. New York and London: G. P. Putnam's Sons. 1915.

In this work the author states the general results of extended studies in genetic and social science and anthropology in recent years. It completes the treatment of Genetic Logic as presented in the three volumes of his work "Thought and Things," giving a critical account of the history of the interpretation of nature and man, both racial and philosophical. He "finds the genetic movement of thought to issue logically neither in Rationalism nor Voluntarism (Pragmatism), nor yet in Positivism, but in a form of interpretation based on direct contemplation, esthetic in character." He argues for a "constructive affectivism" making art the highest vehicle of human apprehension and expression.

It is the author's good rather than evil fortune, probably, that purely extrinsic circumstances led him to put his book into the hands of a new publisher and thus give to it a relatively independent character. Though in every sense a continuation of the thought of the first three volumes, it is at the same time entirely readable for itself. It is marked by a simplicity and lucidity which is possible only to fully ripened thought, and to one who, after using the scaffolding of the technical, knows how to abandon it. Both in thought and in feeling it belongs to the best traditions of the "spiritual" or idealistic tendency in philosophy, taken in its broadest sense.

No review would be adequate which did not at least suggest certain valuable contributions which the book makes to current philosophical discussions more or less independent of the main contention. The exigencies

of space require me to confine myself to the latter, but the reader should at least know that in this book, and still more, in Volume III., where it is more fully developed, is to be found the most adequate recent discussion of value. The genetic development of the value categories is brought into relation with the development of thought in a most enlightening fashion. The treatment of "affective logic," forming an integral part of his theory of value, and of his entire theory of reality, is also worth consideration for its own sake. But of chief importance, perhaps, are the chapters on Religious Interpretation and Religious Reality and Negation. To my mind these constitute the best treatment of the logic of religious experience extant, and in general, a study which no one interested in that subject can afford to neglect. The conclusion that religion does give us a final mode of experience is all important for the author's philosophical position. The actuality of religious objects can, he holds, never be proved, and against the turning of them into values the "unfulfilled categories of reason will always protest." In religion this dualism of actuality and ideality is mitigated, but never radically healed.

As for the main contention of the book—that the genetic movement of thought issues logically in a form of interpretation esthetic in character—the scheme of treatment stands out with simplicity and boldness. A genetic study of interpretation, both in its individual and in its racial aspects, discloses a thoroughgoing parallelism. For both, all interpretation is at the beginning *pre-logical*, in terms of organized social interests. Thought, such as it is, is mythical and animistic and is characterized by an "affective logic," knowing not the control of rational logic or the dualisms which later issue in the opposition of existence and value. The second or logical stage marks a "setting free" and an independent development of the two motives implicit in the pre-logical stage, the motive of truth (and existence) and that of value. Immediacy gives place to mediate thought construction and in this mode all objects have definite predicates of existence and value. The "mediation of truth" leads to the *implication* of reality as absolute and independent. The mediation of value, in terms of means and ends, leads to the *postulate* of absolute value. In this dualism we have the germs of the two great types of philosophical theory, intellectualism and voluntarism, realism and idealism. But the explicit development of these two motives—the hardening of the dualism of "incommensurables,"—brings with it the demand for a "second freeing," from logic and practicality alike. There follows a movement to the hyper-logical or contemplative stage, for which Baldwin finds analogues in both individual and racial experience. It is in this higher immediacy, not in an a-logical reversion to the lower pre-logical stage of mysticism, that reality is found. It does not negate, but includes and reconciles the "implication of reality" and the "postulate of value." This higher immediacy is the esthetic experience.

For this esthetic theory of reality called Pancalism, the author claims no undue novelty. It represents the culmination of a motive constant in philosophy, but one which hitherto has not been able to come into its rights. It is found "more or less incidentally, but none the less really, in

at least three of the great thinkers, Aristotle, Kant, and Schelling." For the thoroughgoing application of the genetic method, however—which, he holds, alone enables this motive to come into its own,—he can with right claim novelty. A certain blood-relationship with "the dialectic"—experience is for Baldwin also an immanent self-integrating movement,—can not indeed be denied, but the method, as this short sketch suggests, is essentially new. The esthetic philosophy in which it issues has, however, failed to carry conviction in the past, and the difficulties which the present statement will have to face are by no means insignificant. In stating them I shall be able, I think, to present what is most important in the position under discussion, and at the same time raise certain questions which must inevitably be suggested by a careful study of the book.

These difficulties are of two kinds. The first concerns the esthetic experience itself. Granting for the moment the legitimacy of the genetic method with its frank abandonment of the logical and ontological points of view, why is it the esthetic rather than the mystical religious, or any other form of immediacy, to which the genetic progression inevitably leads? The second question concerns the genetic method itself and the justification of the abandonment of the logical and ontological points of view.

An initial presumption against the esthetic as the ultimate aspect of reality can not be denied—a fact, by the way, of which the author is himself fully aware. Says a newspaper review of the book, otherwise worthless, "Baldwin's exposition is not very convincing. For a large proportion of mankind the beauty aspect of things is practically non-existent, and as for the few who pay attention to the esthetic qualities of the universe, most are at variance with one another in matters of taste." The superficiality of this remark is obvious, even to one who has not read the book; but surely the fleeting, somewhat aristocratic and parasitic nature of beauty makes the author's task a difficult one. The esthetic experience has little of the massive and instinctive element attaching to the common-sense and religious interpretations of the world. It has none of the atavistic lure that draws others to a pre-logical and mystical union with reality. It is wholly lacking in that wilfulness which gives to idealistic and voluntaristic theories their power. Yet it is to forces such as these that conviction must ultimately appeal, and estheticism makes no such appeals. If in philosophy argument is largely giving reasons for what we believe on other grounds, the task of estheticism is a hard one.

Baldwin reaches his position partly by a negative line of argument, by showing the instability and non-finality of all other types of interpretation, and in this, as is usually the case, he has the most success. But the beautiful is the ultimately real on more positive grounds. Because, tenuous, fleeting, and hard to hold though it may be, it does, while it lasts, mean a reconciliation of those dualisms of the actual and the ideal, of the individual and the universal, which religion never succeeds in uniting, and which philosophy in the form of realism and idealism, intellectualism and voluntarism, can solve only by vainly denying one or the other of the two necessary motives in experience. The esthetic is a unitary and non-relative experience.

Much as I should like to find the arguments for this position convincing (I confess to a private leaning to just such a philosophy as is here developed) I must admit I do not find them so. Space will not permit me to meet them in detail, but I may note two points which seem to me to be fundamental.

The first concerns what I may call the "unstable equilibrium" of the esthetic. It is true, I dare say, that, as Baldwin holds, consummate beauty contains within it the sense of absolute value and absolute reality, the implication of reality, and the postulate of value. But is the antinomy really resolved here, any more than in religion (where, as Baldwin thinks he has shown, it certainly is not)? For myself I think not. The rival tendencies in art which we describe as idealistic and realistic seem to me to be the result of no mere theorizing about art, but rather of an inevitable struggle in the artistic experience itself in which there must be a decision. "The ideals of truth and value remain," says the author (p. 257), "in their fulfilment, different and incommensurable." But do they show any less tendency, each to seek its own fulfilment, in art; and in seeking its own, is either any more tolerant of the other *here* than elsewhere? The dualism between subject and object, between inner and outer controls, is so radical, says the author, that "an essential reconciliation demands a function in which the root of the opposition is removed, and the dualism cured at its source." That function, he is convinced, is the imagination (p. 204). But is the imagination such a function? Is it *satisfied* with itself? Does it not always carry in itself the secret sense of its origin in the playful and the semblant, a feeling that it, too, like religious faith, "conceals the opposition of actuality and ideality 'neath a covering of feeling and intuition?"

My second point has to do with the claim for the absolute, non-relative character of the esthetic experience. Here Baldwin makes much of "art for art's sake" and its dictum as to the essential incommensurability of esthetic objects and situations, *qua* esthetic. "We can not bring two works of art or two esthetic situations into any sort of antagonism or comparison *inter se*." "When the esthetic object is fully constituted it knows no other." Now no one familiar with the nature of the esthetic experience can be insensible to the element of truth in this position, but, as it has been exaggerated by the artist, so I think it is misinterpreted by Baldwin. For after all the same may be said of any kind of mono-ideism, even hypnotic, with which indeed the esthetic is in some aspects closely connected. But I ask, is it *here*, or in the *value and truth judgments* to which the esthetic as semblant mode leads up, that reality is found? The relativity of the esthetic appears at another point. I have spoken of the aristocratic character of the esthetic as militating against an esthetic theory of reality. If, as on the author's view, all esthetic experiences are equally absolute, we have an extreme of democracy. He who says that a novel, for instance "The Rosary," is supremely beautiful, and he who says that it is the veriest slush, are both eternally right. Practically absolute the experience is for both, perhaps, but wholly relative to the subject. Actuality and value are not reconciled, and this higher immediacy is as

little communicable and open to criticism as the lower immediacies and mysticisms against which the author inveighs.

It is at this point, I think, that Baldwin's theory of value, admirable as it is in many respects, breaks down. The esthetic is an experience of value, and in so far as it is a value, it presupposes another. With our way of experiencing is bound up the notion that beyond the valued thing is another thing that has another value, more or less. With value is bound up, *a priori* if you will, the relation of "more or less." To which Baldwin would doubtless answer that the value in the esthetic is immediate, and the relation of more and less arises only in mediation and description. Now immediate value is mediated by the relation of means to ends, and this process issues in the postulate of absolute value, but the more or less is not the result of this mediation, it is rather its source, being inherent in the value-experience itself. In so far, then, as the esthetic is a value-experience, it presupposes another. The point involves far too much for argument here, but I think one can hardly escape the conviction that the esthetic is a value to be related to other values, rather than a third something in which value and existence are reconciled.

While on this question of relativity let me say that, significantly enough, the place of time in the esthetic—and indeed in the author's entire theory of reality,—is left obscure. In the concluding paragraph of his third volume of "Genetic Logic" (p. 260) entitled "Interest and Art" we are told that "some sort of real time is undoubtedly a logical presupposition of esthetic immediatism. It is questionable, no doubt, whether esthetic experience as such implicates time, but a more careful examination fails I think to remove all form of duration. . . . It is a difficult problem . . . which no philosophy ought to shirk." In the present volume, however, there is no reference to time—the topic does not even appear in the index.

Such questions as these might be raised by one in sympathy with the author's general position and method, and who perhaps regretted that the case for the esthetic as a reconciliation of reality and value is not fully made out. Far otherwise must the case appear for the "logicians" and ontologists in philosophy. The thought of a "genetic logic" in four volumes must have caused many a logician to wonder at the perversity of the human mind; that it should culminate in a "genetic theory of reality" must fill the ontologists with despair. But Baldwin has the courage of his convictions, even in his titles!

Critics of the earlier volumes (especially Professor Creighton) have insisted that a genetic logic is a contradiction in terms, more specifically that "genetic" as employed in the scientific Darwinian sense, presupposing that it does the dualism of mind and environment, is quite different from, and indeed contradictory to, the logical or teleological point of view which looks upon experience as an immanent self-integrating movement. To all this Baldwin replies¹ that it is precisely in this latter sense that "genetic" is employed, and that there is no contradiction, for "this very immanent movement establishes the dualism which science employs." This

¹ Vol. III., Appendix B.

broader view, therefore, "issues in and justifies the narrower." Now it is obviously impossible for me to go into this dispute here, but I wish to point out that there is a problem here which Baldwin has not yet satisfactorily solved. There seems to be scarcely any question that development, progression, in this broader sense, presupposes the "ontological" point of view. But Baldwin maintains that he is able "to refute both the logical and metaphysical methods of approaching reality in favor of a psychological or genetic one" (p. 221). It looks very much as though, after all, the broader view were used to justify the narrower psychological, and the latter then employed to cut away the presuppositions of the former. Is it possible that Baldwin has been tempted to the very common philosophical weakness of wanting to keep his cake and eat it too?

"The question, what then is reality is on the readers lips," says the author near the end of the book (p. 303), and the answer is "reality is just all the contents of consciousness so far as organized or capable of organization in esthetic form." In another place we read, "reality in the last analysis is what we mean by reality" (p. 227). "Reality, apart from all meaning for experience is an absurdity, a mere word." He frankly abandons the logical and ontological points of view (pp. 224, 294) and thus cuts the ground from under his critics' feet. But can the genetic method be made to justify this procedure? I think not. The genetic method is itself either a category of existence or of value. If it is the former the logical and ontological categories remain ultimate. If the latter the ontological and logical categories must be reduced to values (meaning is essentially a value concept). One or the other must triumph in philosophy, as in religion and art. If such dominance is not possible must we not remain content with a dualism?

I have said that the book before us continues the best traditions of the idealistic and spiritual tendency in philosophy. But this is true only if that tendency be understood in the broadest sense. In fact one comes nearer to the true inwardness of the book if it be described as an attempt to transcend the realistic-idealistic contrast and opposition. Indeed the author explicitly says² that his position is "neither realistic nor idealistic."

It is for this reason that I personally welcome the book, and believe that it will especially repay study. For despite superficial signs to the contrary, I think it must be admitted that this attempt is in line with the deeper undercurrent in philosophical thought. Pragmatism is at bottom such an attempt, its very instability, tempted as it is now into realism and now into idealism, proving not necessarily the impossibility of the task, but rather the limitations of pragmatism. Bergson has specifically described his philosophy as such an attempt, and if it too is unsuccessful, it is perhaps because of a misinterpretation of the terms to be transcended. So too the "value philosophies" which, though they have developed in the idealistic tradition, may more fairly be described as an effort to overcome this opposition by the reduction of all the categories of experience to values. It is to this deeper current of philosophical thought that Baldwin's book belongs. If, as I think for the reasons suggested, the results of the

² Vol. III., Appendix B, page 271.

genetic method are not wholly successful and the esthetic will not bear the task imposed upon it, it by no means follows that the interpretation of experience which it makes possible, does not constitute a significant step along the path which philosophy is bound to go. The tremendous piece of work of which this volume is the culmination has an assured place in the philosophy of the present.

The book is furnished with an index and a glossary of (ninety) terms with their definitions as employed throughout the four volumes of the *Genetic Logic*. The definitions are accompanied by illustrations.

WILBUR M. URBAN.

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Bericht über den VI. Kongress für experimentelle Psychologie in Göttingen vom 15. bis 18 April, 1914. F. SCHUMANN. Verlag v. Johann Ambrosius Barth, Leipzig, 1914. 351 Seiten. M. 11.

The report is in four parts, "Vorträge," "Geschäftliche, Mitteilungen," "Nachtrag," and "Sammelreferate," and covers nearly all the phases of psychology, as the following selected notes signify. A study of interest to students of abnormal psychology in the "Vorträge," entitled "Zur Dynamik des Nervensystems," sets forth unusual findings chiefly from one subject corroborated by results on other reagents. The procedure was to put the subject under light hypnosis, cover his head with an opaque cloth, and make noiseless passes over a glass plate resting a few centimeters above the subject's bare forearm and hand. The function of the plate was to exclude perceptible currents of air in making passes or to vary the warmth of the hypnotist's hand. In this manner analgesia, hyperalgesia, and hyperesthesia were induced. Alrutz concludes that aside from possible telepathic action the phenomena must have been due to some kind of influence of the experimenter's nervous system upon the reagent. Alrutz reports that pointing the finger at the reagent's bare volar forearm produced flexion of the fingers as in response to an electrode, and that pointing the finger at certain tendons produced extension. Ziehen objects, believing the phenomena are due merely to the subject's hypersuggestibility. Alrutz also reports a means of studying the hot sensation.

A. Gelb reports, "Versuche auf dem Gebiet der Zeit- und Raumschauung," using three lights presented successively at varied time and space intervals so that lights 1 and 3 mark the base and light 2 the apex of an imaginary isosceles triangle. As the distance between the lights varied, so varied the apparent time interval between their occurrence. When the points were illuminated successively and when the time interval between the flashing of point 1 and point 2 was greater or less than that between points 2 and 3, the triangle seemed asymmetrical. Similar displacement was observed in the realms of pressure and sound. Gelb believes the explanation rests with central factors and not in eye-movement and innervation. E. R. Jaensch, in his study, "Ueber Grundfragen der Farbenpsychologie," holds the opinion that contrast phenomena are p

chophysical in their nature and inclines toward Hering's color theory.

W. Baade reports a study of isolated sensations and states that although his reagents claim there was a noticeable phase of the perception process where a tune is heard or a color seen without its meaning, he doubts their testimony, believing they have overlooked some heterogeneous ingredient. A. Guttmann, in "Experimentelle Halluzinationen durch Anhalonium Lewini," obtained visual hallucinations (never auditory) accompanied by clear consciousness, but not under its control. Intelligence tests showed no deviation from the normal and an acceleration of mental functioning. Interesting physiological disturbances are described. Jaensch states that the method affords a medium for the study of sleep, dreams, the will, sensation, association, and memory.

In the "Nachtrag" O. Pfungst, in "Versuche und Beobachtungen an jungen Wölfen," to determine whether the psychical characters of the dog are found in the wolf, reports finding the same qualities, proving that domestication has not changed the dog's fundamental psychical character. In the "Sammelreferate" are three extended articles, one of particular value to psychology, by O. Klemm, "Ueber die Lokalisation von Schallreizen," consisting of 89 pages with an accompanying bibliography of 246 titles. In this work Klemm brings together the gist of previous studies of the question. A valuable discussion of the physiological factors in localization, and of localization in the blind, in children, and animals is given. Klemm concludes with a survey of the various theories of sound localization. The other studies in the "Sammelreferate" are "Beziehungen der Gemütsbewegungen und Gefühle zu Störungen der Sprache," by H. Gutzmann, and "Ueber neuere Untersuchungen zur Tonlehre," by C. Stumpf.

JOHN W. TODD.

INDIANA UNIVERSITY.

JOURNALS AND NEW BOOKS

REVUE DE METAPHYSIQUE ET DE MORALE. January, 1916.
L'Anti-cartésianisme de Malbranche (pp. 1-26): M. BLONDEL. - The opposition springs from Malbranche's identification of metaphysics and speculative theology, which Descartes tends more and more to separate.
L'Intellectualisme de Malbranche (pp. 27-36): É. BOUTROUX. - A study of the nature of the intelligence to which Malbranche submits all things even the Divine.
L'Optique de Malbranche (pp. 37-91): P. DUHEM. - A proof that Malbranche first introduced the conception of light as due to ether vibrations of which the period determines the color, and the amplitude the intensity.
Le Traité de Morale de Malbranche (pp. 92-126): R. THAMIN. - An exposition of the contents of this work which, the author believes, is far too little known.
Comment Malbranche conçoit la Psychologie (pp. 127-146): VAN BRIËMA. - His psychology is a sort of compromise between Cartesianism and his theologico-metaphysical ideas. Many observations later used by Berkeley are made by him.
Malbranche et Maine de Biran

(pp. 147-162): V. DELBOS. - An exposition of the agreements and differences of these two philosophers, suggested by a phrase of Victor Cousin. *Pour une édition de Malbranche* (pp. 163-175): D. ROUSTAN. - The author points out the defects of the few existing editions of Malbranche, none of which is modern, and makes a plea for a new one worthy of Malbranche's important place in the history of thought.

Dewey, John. *Democracy and Education. An Introduction to the Philosophy of Education.* Text-book Series in Education edited by Paul Monroe. New York: The Macmillan Company. 1916. Pp. xii + 434.

Duckworth, W. L. H. *Morphology and Anthropology. Volume I.* Cambridge: Cambridge University Press. 1915. Pp. xvi + 304. 10 s. 6 d.

NOTES AND NEWS

THE papers presented at the meeting of the American Philosophical Association held at the University of Pennsylvania on December 28-30, 1915, in honor of Professor Royce, together with a number of papers by other writers who wished to share in this testimony of loyalty and affection have been published by the *Philosophical Review* and make a stout volume of 522 pages. There is prefixed an excellent portrait of Professor Royce taken in 1914 and prefixed to Professor Royce's response at the Association dinner is a portrait representing him at the age of 20, made in 1876. The bibliography of Professor Royce's writings, compiled by Benjamin Rand contains 117 titles of books and articles, and in addition there are 34 titles of critical articles by other writers.

IN view of conditions produced by the war, the Kant-Gesellschaft has been postponed until April 15, 1917, the final date for receiving papers offered in competition for the prizes of 1,500 and 1,000 marks to be awarded for the best and second best discussions of the theme, "Edward von Hartmann's Doctrine of Categories and its Significance for Contemporary Philosophy." The judges will be Professor Bauch, at Jena; Professor Cohn, at Freiburg; Professor Heinrich Maier, at Göttingen. Further information will be supplied on request by Dr. Arthur Liebert, Fasanenstrasse, 48, Berlin.

DR. M. T. MCCLURE has been advanced from the position of assistant professor to that of associate professor of philosophy, at the Tulane University.

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

A SUGGESTED METAPHYSICS TO FIT A FUNCTIONAL EPISTEMOLOGY

PRAGMATISM, especially that brand of pragmatism which is better called instrumentalism, has been much haggled over, yet the discussion has amounted to little more than a mutual misunderstanding of terms, even beyond that point where this failing, so needful in some small amount to give zest to discussion, has waxed to a deadly malady, so that it would almost seem well to forego the intercourse of ideas entirely, and allow that both the *pros* and *antis* leave their contentions to be judged by what they finally work out to. Perhaps it is not entirely without blame to itself that instrumentalism finds such odious misrepresentation to be its lot. That ingenious innocence of schematization and terminology, which has been no small aid to the theory's attaining vigorous growth, certainly militates against its receiving fair and intelligent criticism. To find a metaphysic for instrumentalism might aid much in obviating this difficulty, though at the same time risking the loss of the doctrine in the uncertainty of the venture. The more especially so because any development of a metaphysic must border so closely upon the dialectic as to appear ill fitted to such a go-it-to-the-end empiricism as that upon which our theory bases its claims. Nevertheless, such is the adventure before this discussion.

But, before the final plunge into the problem, the warning is proper that the only logic to be expected is that in accordance with a functional interpretation of knowledge. There is to be no attempt at proof according to any static logic, but only a working together of ideas for mutual clarification, or else the elimination of those unfitted for participation. The whole may turn out to be a flagrant example of *Petitio Principii*, and be none the worse for it, if only the ideas do not quarrel one with another. Having thus severed the last mooring to responsibility of conduct, the discussion may now fare forth upon its chosen way.

Three words immediately assume leading rôles, *experience*, *experimenting*, and the *unstatic*, and the last is that which affords a keynote to the metaphysic, and this is so because of the wariness, which is

peculiar to instrumentalism, of all that comedy of analysis in which the well-worn and conventional masques of the harlot and the parasite, the intuition and the reason, cover the God-given features of the facts, and nothing remains to be done but to fit the characters with new witticisms of dialogue. The rather there is a reaching for the native stuff of living. And thus we tumble into the vortex of the unstatic, and are shut from easy recourse to words for the explanation of the unexplainable.

This thing the unstatic is a chaos of pure motion, activity, kinetic force. In it there is differentiation through force and direction alone, in every part of it is continual mutation through action between its elements, always mutual dependence in character. Complexity is the very essence of it. For absence of complexity means uniformity, fixedness of activity, change, motion. But there can be no differentiation into exclusive and categorical kinds. Hence the pluralism existent is only one of variation in function. And in such functioning there is mutation, perhaps microscopic, perhaps gigantic, but always continual. The only ever-present feature is that of direction, the only uniformity possible is that of direction. But no single direction is everlastingly the same, determined for one element, for every element exists amid an infinitude of other directive forces, it is dependent upon them for character, as each of them is dependent upon it. But this dependence is not to the exclusion of antagonism, for the very shaping of one element is through its being set over against other forces. The one primal fact is, however, motion, force. So the only sort of an element is a kinetic, and this may only be individual through present uniformity of direction. Every real is a kinetic.

In keeping with the force of this concept *unstatic* there are brought to light these dictums:

I. Two reals may not be exclusively and continuously different in kind.

II. Two reals, mutually antagonistic in direction, entering into a common situation, must be either mutually modified, or else merged into a new real.

III. The component directional elements entering into a real can not retain individual determination, but may be only aspects of one dynamic whole.

IV. No persistent element may exist independent of or unchanged by the boundless complex whole.

V. In every process there is present a creative possibility.

While such a statement of the nature of reality is not *a propos* merely to functional epistemology, it is perhaps most strikingly fitting as viewed in the light of this theory. The refusal of yes-and-no

demarcations of mental facts into sensations, percepts, and concepts; the emphasis upon the functional unity and mutual development of mental elements; and the constant suspicion shown towards any dividing of activities into continuous and antithetical sorts or faculties, as the objective and subjective; the emphasis upon the creative character of thinking; the considering of the elements present in thinking as themselves active, not passive to the manipulation of a mind, and also as continuous with reality, not set over against reality; all these make such an epistemology and such a metaphysic fit hand and glove.

But most of all do they agree in the forswearing of all word-entities. The *ding-an-sich*, the merely potential, the mind, the ego, and all such beings as most bedevil thinking are at least prayed against, though they may surreptitiously creep in through the weakness of language. It is strange what fond reverence the enlightened among us still show towards this old crop of thought hindrances. They can behold any single activity fading away into an infinite regress, but to think of it they must block that endless unraveling of things, they must tie the loose ends together with a word. Ask them the force of the word and it resolves into an activity, but still the sound of the phrase "static term" is the only solace to their mental dilemmas. Or they may refuse every intelligible, though superstitious, meaning for the word mind, and yet they leave the mystical word there to come valiantly to the rescue of any fact in distress. Such a shortcoming is undoubtedly due to domestic tidiness in thought, but for the seer of the unstatic it seems to shut the door against many a waif fact which, while not tidily fitting into place, has perhaps the secret of rejuvenation in it. And it is this attempt to eliminate word solutions upon which a metaphysic of the unstatic must rest for recommendation.

But the modification, due to the emphasis upon the unstatic, which is most important for the whole subject of epistemology, is that in the meaning of the term *experience*. Accepting that word to denote the realm within which experiencing takes place, we are brought to the question of the relation between experience and reality. As already noticed, the existence of any mutually exclusive, and persistently differentiated kinds of reals, is repugnant to the concept unstatic. Such an exclusion from reality would seem to smite hip and thigh any persistent subject-object relation in experience, while the mutual interdependence of reals would find little room in an experience which was the free offering of discrete data to a mind for arrangement. Hence even without the presence of the word-entity mind coming to question, such a conception of experience would seem to work poorly, when the unstatic was uppermost in the situation.

Finally, both the principle of mutual relatedness, and the principle of exclusion of categorically different kinds, refuse the idea of experience being a realm within reality. Experience must be extensive with reality. The total complex of interrelated reals which makes up the world, this is experience. But within the whole there occur particular series of interactivities which may be called experiencing. But the whole may not be considered as an active entity; it is a sum total which may not be added. Nor in it are the various links and incongruities of the particulars smoothed out in a unity of higher purposefulness. It is simply an ever widening hodge-podge of contradictory reals. To this plexus of kinetics, the word experience may not be applied as definitive of its character or structure, but only as marking the-everywhere-present-in-it-potentiality of relationship in some experiencing, and the always actual continuity of interaction between any experiencing and its utmost bounds. When, then, the relation between an experiencing and experience is spoken of, the term reality might equally well be used, except that it would hint at a discontinuity, which suggestion is to be avoided. The connection, however, between experience and any particular experiencing, is necessary to realize.

Most emphatically important in this connection is the serial character of experiencing. It, itself, is not an activity, totally distinct and self-characteristic, to be set over against some other generic or different sort of activity. On the contrary any real may enter into a situation wherein it acquires an aspect which renders it a part of an experiencing series, while every real in such a series works over into participation in other sorts of series. But what does give experiencing, or any other process for that matter, continuity, is local interaction, and community of function among the elements entering into it.

In ordinary living, and in the treatment of experience from a physical and physiological standpoint, experiencing is recognized as taking place in individual centers. But the stuff which is individualized in experiencing is not limited to the individual centers. It is independent and self-constituted, common to all individual experiences inasmuch as it may enter into any of them. And it does enter into them and become individualized for the sake of readaptation to a special end. This individualizing process is one of acquiring a purpose and fulfilling it. It takes place in all animate centers from the simplest protoplasmic cell to the human being. And the purpose required and fulfilled when the process is successful is the continuation of that part of the world stuff belonging to the special animal complex. In this total individualizing process, every animal functioning, whether digestive, ratiocinative, or what not, plays a part. In experiencing being considered from the epistemological side,

most important activities of the experiencing series are those which function in consciousness.

So, experience is the total of reality, and that within which any particular experiencing occurs, and of which every element in any experiencing series is an integral part.

Experiencing is that functional continuity of reals in an individual center through which experience becomes modified for the sake of continued animate existence.

Formidable as this latter may sound, yet when stated in an unguarded way, it means only that by experiencing is denoted whatever it is to be animate, not gaseous, nor mineral, nor in any way dead. It is just what each of us has when he is alive and wriggling.

However, in this treatment of the relation between experience and experiencing, a most traitorous word has found harborage. The term consciousness, if left unchallenged, might with ease betray the whole discussion. It must be rendered innocuous. Above all may it not convey the picture of a Tibetan realm, presided over by the grand lama, mind. The aforementioned aversion to word entities would object strongly to the referring of consciousness to the activity of a mind. But even if mind be taken as being but a class name for activities inherently different in kind, the distinction between activities as conscious, or mental, and non-conscious, or physical, would not be possible with a metaphysic of the unstatic as a background. That is, if such a distinction be taken as a categorical differentiation according to sorts.

This follows immediately upon the first dictum stated as dependent upon the characterization of the unstatic. But the application of this corollary here is so important that a consideration of its appropriateness with the concept of the unstatic is enforced. When the fundamental fact of things is considered to be motion, change, force, no qualification of elements would be in keeping which was not describable in terms of direction or force. Any positing of a mystical specificity as a distinguishing feature of one thing as against another would be unfitting. But the only distinction which would apply to difference of function would be as to direction, since difference of force, or velocity, would be merely in intensity. Then no two elements could be permanently differentiated, since the direction of either would be subject to at least small variation through existence among other forces, and so there would be the possibility of mutual transformation into similarity.

Therefore a conscious real may not be marked off as one having a specific quality consciousness, but must be defined in terms of whatever peculiarity of function is common to such reals. This is what most marks a piece of reality as being included in an experiencing

series rather than a brute physical one. Only does a real become conscious when for it there is hesitation in direction. It must be not merely uncertain, but hesitant in a selective situation in which the general directive force of the experiencing series takes part in the determination of the final direction which the real assumes in the series. This might be expressed in the terms of vitalistic biology as meaning that a real becomes conscious when there is selective reaction to it, and only then. So, in a stone, light does not act as a conscious element because the meaning of light for the stone's existence is unquestioned. But for the animate complex there is just that question of direction between this way and that. Does this light mean to come near or draw off? In every such coming to consciousness there seems to be a genuine indeterminism as to final upshot, and a drawing into the suspense of the rest of that centered reality which is the center of experiencing. Always the question affects, to some small extent at least, the possibility of further comfortable experiencing and future successful meeting of such perplexities.

Consciousness, then, is the quality of hesitation in direction present for all reals in their higher functioning within the experiencing series.

There is thus in every conscious functioning of experience in experiencing, a quality of uncertainty, which might lead to the statement that every element entering into an experiencing is liable to a subjective phase, if the adjective subjective were to be taken in the commonly found sense of shady, questionable. This subjectivity may consist in a question as to the element's own proper directive force, or, if its own direction be not in immediate question, subjectivity may be referred to it as it enters into the determination of some other element's bearing, and is thus modified in its own direction or force. However, this subjectivity forms no inalienable characteristic of any element such as to make it distinct in kind. For no matter how uncertain an element may be in one situation, it may in another be a factually determining member. The dream hallucination, though instantly discounted as meaning a thing to be yelled at, may become of grave factual importance for a Freudian analysis of one's subconscious. On the other hand, no element is so determined in its force as not possibly to be rendered uncertain, particularly if it be so unfortunate as to be functioning in a philosopher's mind.

Yet there is something inexplicable in this subjectivity found in the experiencing process, just as there is something inexplicable, that is, which escapes complete causal description, in a physical process. But to posit here the activity of such an entity as the subject, in order to furnish a stop-gap for thinking, is a purely gratuitous piece of word worship. The subjective may only belong to a subject in the

sense of being referred to an interrogation point. But far from invalidating an element as a part of experiencing, this interrogatory character enhances it. It is in this way that it functions for the adaptation of its meaning and other meanings it meets to the needs of any particular situation.

With this final flourish of its decapitating scimitar against a word entity, this metaphysic of the unstatic may rest content as at least having exhibited in the rough its most dangerous traits. Probably it was not entirely fortuitous that the word *unstatic* instead of some such positive term as *dynamic* was taken as the center of this conception of things. For its procedure is for the most part from the negative side of the question to the weeding out of artificial terms, if they be equated to existential entities. Also the method used was influenced by a feeling against arbitrary classification and too categorical distinctions. On the positive side, this discussion offers a tentative sketch for a background to instrumentalism, the chief craving throughout having been to develop coherently the metaphysical hints gleaned from Professor Dewey's various works. The whole feeling of Professor Dewey's thought, as understood here, calls for continuity of interactivity, and universal dynamic effectiveness throughout reality, while frowning upon any over-rude anti-intellectualism. This suggested metaphysics will be best understood, then, when looked upon as a working out of these thought factors into amicable relationship.

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PRIMITIVE IMPROVIDENCE

FORESIGHT is one of the virtues civilized man never tires of arrogating to himself. He is civilized, in fact, he declares, just because he is foreseeing, because he is self-denying, saving, provident. "Our commerce, manufactures, education, culture,—everything is for the satisfaction of future needs. It is this sense of to-morrow which stings us to work. The haunting specter of possible wants, even when we are needing nothing, the hope of future rewards, the confidence of success, of fear of failure,—these are the stimuli which carry us along from savagery to civilization. The savage at first has no sense of them,—or at least but very little."¹

There may be something in these assertions, but I have always been inclined to think them at least exaggerated, and based not only on cultural egotism, but on ethnological ignorance. Having just returned from a rain dance at Zuñi, New Mexico, I find myself of an even more emphatically challenging disposition.

¹ Shotwell, J. T., This JOURNAL, Vol. XII., page 201.

That ceremonial to bring rain was one of the *ko'kokshi* ceremonies, "a dance for good" which is performed several times every year during the season of the growing crops. It is a one-day ceremonial, but it may be repeated at request, at the request of any one. It was repeated four times when I was in Zuñi,² making a continuous performance of five days. It meant hard work, work in preparing the masks and costumes, work for the kinswomen of the dancers, the kinswomen having to prepare food not only for the dancers, a varying number, about fifty, but for more than fifty other members of the *kiwitsine* or sacred club-house, the turn of which it is to present the dance, and the dancing itself is an extremely laborious and tiring activity. Beside the twice daily public performance, rites are no doubt undertaken in the *kiwitsine*. The dancers sleep there³ under conditions, I surmise, perhaps a bit uncomfortable. And of course whatever the weather conditions, quasi-tropic sunshine or torrential downpour, they go on with their dance. On the whole the *ko'kokshi* represents, it seems to me, a somewhat greater labor and a somewhat stricter self-denial than the prayer for rain made in time of drought in a Christian pulpit.

In Zuñi, ceremonials for communal benefit or advantage follow one another throughout the year. And, let us remember, they accompany, they do not preclude, the secular activities of an agricultural and pastoral life. There are sixty-five thousand head of sheep to be cared for on the Zuñi reservation and there are wide-stretching fields of wheat and corn to be planted and harvested. And this farming is done with care, too. The Zuñi have a "joke" upon one of the Indian agents once sent them from "Washington." "Why go to the trouble of making ridges of soil along each row of grain?" he had queried, and he had had a field planted in the American fashion. The next sand-storm laid it waste.

Even harder upon the young crops than a sand-storm is a grass-hopper invasion. To find out the cause of such devastating hordes the Zuñi take no end of trouble. For it means to them that they must find the witch who sent the plague upon them, and witches are elusive. In case of sickness, too, the sickness-sending witch has to be discovered. As far as witches are concerned the Zuñi certainly show no lack of forethought. They are in constant dread of their possible machinations. And their precautions against them are endless—extending even after death. They take forethought indeed in many ways for the dead. Food is supplied for the journey to *ko'luwala* and during the four days that the deceased may linger about his old home the house door is left ajar. And then in all the time to follow

² August, 1915.

³ During all ceremonials conjugal continence must be observed.

a bit of food is scattered, dropped on the fire or on the floor, before each meal. "Take this and make our little boy or girl grow up strong and well, and give us plenty of rain"—this is the prayer that goes with the offering, surely not an uncalculating prayer. The bit of food may not represent much self-denial, but there can be no question that the property destroyed with the dead is a considerable economic loss. The best clothes and blankets are put on the corpse, and the most valued jewelry. And the other personal belongings of the dead are burned or buried in the bank of the river that flows into *ko'iuwala's* sacred lake.

You may have proved your point about the self-denial and the forethought of the Zuñi—the expressions only are different from what we are accustomed to, I may be told, but are not the Zuñi an advanced tribe, are not the Pueblos the most advanced of all the North American tribes, tribes that are themselves advanced in comparison with other savage peoples? Your story about their perspicacity in farming is a proof in itself of Zuñi advancement. But what of the nomad hunter peoples?

The nomad hunter, I rejoin, does not dispense with hunting ceremonial and hunting magic, any more than the "advanced" agriculturist or herder. And ceremonial and magical beliefs *always* mean forethought and self-denial. The forethought and self-denial at the time of death are even more pronounced in the case of peoples of a more primitive culture than with the Zuñi. More elaborate, too, in the more primitive cultures are the magical methods taken to get offspring, to insure their growth, to *make* men, to establish conjugal fidelity, to quarantine against witchcraft, to bring good fortune of all kinds to people and to save them from misfortune. I would almost say, in fact, that the more primitive the group the greater its anxiety about mishaps, and the more solicitous it is of precluding them. It is excessive providence, indeed, not improvidence, which is a sign of savagery. It is his providence, not, as Professor Shotwell has put it, his improvidence which keeps man a savage.

The difference, for I am not claiming there is no difference between modern and primitive man or rather between modern and primitive culture, is in the direction taken by human providence. The belief prevails in primitive societies that everything is subject to control, if not by ordinary men, then by the gods or their priest proxies, everything—birth, growth, decay, death, men and animals, all nature. And so in connection with all, forethought must be applied, and upon all, care expended. In societies less primitive, these ambitions are curtailed—the wild animal is not charmed before he is hunted, or the enemy befuddled before he is attacked, the rain clouds are not danced for, shrines are not visited the better to conceive offspring, the young

are not hurried into adolescence or manhood, the departed spirit is left to take care of himself. The age-old tradition, in fact, that nature is the servant of man begins to be given up or at least revised. Some natural processes are left alone.

Some day, who knows, the world's culture may develop to such a point that we ancients of the twentieth century will be charged in our turn with having misdirected our providence and the charge may take the form of accusing us of improvidence, of improvidence of health, of youth, of happiness, of most of the joys and delights this world offers.

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SOCIETIES

THE SIXTEENTH ANNUAL MEETING OF THE WESTERN PHILOSOPHICAL ASSOCIATION

THE sixteenth annual meeting of the Western Philosophical Association was held at St. Louis, April 21 and 22, 1916, the Association meeting as guests of Washington University. The first of the two days of the session was devoted to papers dealing with the philosophy of the state, which had been chosen as the main topic of the meeting. At both morning and afternoon sessions the discussions were animated and keen, the interest of the participants reflecting vividly the aroused condition of public opinion in matters of statecraft. The problems foremost in the papers and in the discussions may be summarized: (1) The meaning of individualism and the place of initiative in the Hegelian and other German conceptions of the state; especially, are liberty and progress possible in a state organized as a logically closed system? (2) Liberty in relation to democracy: what are the guarantees of freedom, and indeed what is the meaning of freedom in a democracy? (3) The relation of economic and political freedom, and the possibility of adjusting these without disrupting democratic institutions. (4) The definition of nationality: if race, language, religion, politics, do not make the nation, what is it? As a whole, both in papers and discussions there was more of a tendency to set and define problems than to suggest solutions.

The evening session of the first day was held at the University Club, where the Association was entertained at dinner, and later listened to the address of the president, Professor A. H. Lloyd, on "The Doctrinaire in Time of Crisis." This address is to be published in the July number of *The International Journal of Ethics*. In substance it was a spirited and impressive plea for the fuller recognition of the power of philosophy in the guidance of states and the

determination of the course of history, and at the same time for the value of this guidance to the civic intelligence of mankind.

The papers of the second day were devoted in the morning session to problems dealing with the philosophy of values, in the afternoon to the problem of knowledge. The strong pragmatic bent of the Western Association found free expression, and came to a lively climax in Professor A. W. Moore's witty and shrewd criticism of the neo-realists—a paper which, it is understood, is to form a chapter in a forthcoming collective volume by a group of western pragmatists.

At the business session Professor G. H. Mead was elected president for the ensuing year, Professor H. W. Wright vice-president, and Professor E. L. Schaub secretary. At the same session a resolution was passed requesting the American Philosophical Association in conjunction with the Western and Southern Philosophical Associations to formulate a scheme of amalgamation into a single national society. A well-attended supper at Lippe's Rathskellar closed what all the participants felt to have been one of the most successful of the Western Association's meetings.

Following are synopses of the papers in the order of their reading:

Nature, Reason, and the Limits of State Authority.—EDMUND H. HOLLANDS.

This paper discussed Hegel's "Philosophie des Rechts" as the classical statement of the theory of the absolute state. Hegel's position was a return in theory to what the ancient city-state had been in practise—an absolute state, whose institutions critical reason had little chance to influence, largely because it denied the right of free association. In the Middle Ages there was no absolute "state," and the law of nature was theoretically superior to the law of any state. Political power and moral reason had been separated and opposed at the opening of the modern period; but Hegel believed the modern state to be the synthesis of both, and hence the absolute embodiment of all human interests. His proof for this involves the assumption that all interests beside family interests are united and realized in the institution of property, which in its turn requires the law of the state. It also involves making the state infallible, and denying freedom of thought to both religion and science. His conclusion is contrary to the general method of his own philosophy, which would demand the transcendence of every moral principle to its immediate objectification, and therefore its embodiment in organizations which are, or may be, wider than the state.

In opposition to the theory of the absolute state, the paper maintained that the moral reason recognizes common goods of men as men,

not merely as citizens. Men associating themselves to realize such goods create organizations which are potentially wider than the state. There are four general classes of such organizations, and it is in this connection that the question of an international court arises. The alternative to such a court is a world-state; this is immoral because the absolute state is on a wider scale. The direct function of the state as such is political, not cultural. Its true principle is to guarantee the freedom of its citizens under the law. The right of free association is therefore fundamental in political ethics. Such associations the state should protect, and at times directly promote; but they are independent of it. They protect the individual against state tyranny, and will, in the long run, tend to protect states against mutual injustice and war.

The Principle of the Organization of the State.—G. H. MEAD.

Read by title.

Philosophia Ancilla Civitatis.—HORACE C. LONGWELL.

Pure truth-seeking, wholly disinterested and exempt from expediency, must remain only an ideal. For, however free inquiry may become, it must be bound at least by regard for the interests of the social organism, as conditioning groundwork of all human activity, including speculation. Any surviving organism owes its successful adaptation to very substantial integration of parts; this requires a compactly functioning mechanism enormously preponderant over any free-play. In the social organism this dominant mass appears as institutional life, basic for survival and instinctively safeguarded. Individual initiative may at best "loosen the screws" but never seriously jeopardize the "machinery" itself. From this viewpoint, all restrictions on free-thought are essentially protests against anti-social tendencies. Hence, whatever the regnant guardian (state, church, etc.), philosophy will be withheld from inquiry which disregards the welfare of society. (Illustrations: Denial of the doctrine of philosophy as ancillary to theology accompanied by its subordination to social welfare.) But not only does society thus act as a general determinant; in particular it shapes the very course of thought which, in its history, oscillates between monism and pluralism as extremes. This pendulous swing results from the interests of the social organism controlling speculation. For the monistic tendency of reason, as instrument for systematization, is initially consonant with and an aid to the process of social integration, but logically developed so mechanizes as to eliminate all free-play. Recourse to the pluralistic tendency at first saves values, but issues in such laxity as to be abandoned in turn. This course is apparently inevitable. Utility of this viewpoint in elucidating the history of thought.

Liberty and the Social System.—GEORGE H. SABINE.

The earlier theories of political liberty, especially the theory of natural rights, are vitiated by their emphasis upon the supposed inconsistency of freedom and restraint by law, though the effective political practise of this liberalism, which aimed to secure by law the very liberties which were held to be prior to law, really rested upon the opposite assumption. It was therefore necessary to reconstruct the theory of political liberty in such a way as to show the dependence of freedom upon the restraints of social organization. This was accomplished by a more adequate conception of the individual on the one hand and of social organization on the other; the development of individuality was shown to be dependent upon culture which is essentially social, and social organization was shown not to be the analogue of temporary, voluntary associations. The English idealists, following Hegel, thus conceived self-development as the process of entering into the achieved culture which was objectified in institutions and social organization. Instead of an antithesis between freedom and law, Professor Bosanquet emphasizes that between the actual and the real will. The actual individual, because he is imperfectly socialized, has an actual will which brings him more or less into conflict with social organization. The latter, however, represents his real will, the good which he would recognize if his imperfections and impartialities could be purged away. True freedom and law are thus at one in the real will as it exists in society and as it is more or less perfectly realized in the individual. The freedom which appears to be contrary to institutions is only the unrestraint of the unsocialized actual will. The concept here used is identical with the concept of system developed in the idealist logic. Society is conceived as a system in which each individual obtains his real character by his relations to the other parts of the system. The superiority in some respects of this view to the older liberalism is evident, but it is defective in that it involves a static view of the social system. As against the system, the individual seems to be always wrong; his obligation is summed up in the requirement to find a station in the social system. But the essence of freedom and individuality lies in making such a station for oneself. The system in fact requires to be remade by the initiative of individuals, but idealism characteristically regards the system as self-creating and self-developing. Professor Bosanquet, however, in developing his view of the state, limits state action to the negative rôle of removing hindrances to the good life. It is thus admitted that the good as positively realized is to be found in the individual consciousness. Only the individual is valuable *per se*, a view which agrees better with the theory of natural rights than with the view that the indi-

vidual derives his value from his place in the social system. This suggests that the social system is really no more ultimate than the individual, but that the forces of reconstruction and conservation are coordinate. The way is thus open for a modified individualism as the basis for a theory of political liberalism.

Liberty and Democracy.—H. B. ALEXANDER.

The humanitarian ideal of liberty, equality, fraternity has been rudely overthrown by the war. The political idealism of the western world must be reconstructed. The conception of liberty is the keynote of American history. But liberty has never been truly defined in America. The ideal oscillates between anarchic individualism and fantastic equalism. Germany stands for a conception of feudal statehood. Its virtue is not liberty, but loyalty, expressed in the common acceptance of concordant design. The "overindividual state" and a militarist socialism are natural outcomes (a "militarism" which is not a thing of arms, but a subjection of the spirit). But here is no salve for the lost freedom; not happiness, but the right to create is what man demands for his civic well-being. A state in which the will to act is always controlled by collectivist purposes is only an organized mob. The mob-mind, no matter how highly organized, is inferior to the individual mind. The excellences of mind (as recognized in human history) develop through detachment from affairs, not through social absorption. Liberty of mind is essential to all realization of ideal values. Is a truly democratic liberty possible? Organization for material interests is essential to society; organization of ideal interests is ruinous. If a mean is to be found between these, it is by way of the conceptions of law and justice. Law in the state is the equivalent of self-control in the individual; justice is the equivalent of the exercise of reason. Liberty—a mean between license and slavery—can exist only in states where the individual intelligences are eternally alert; hence, where there is some degree of strife and friction. Liberty is the delicate equilibrium of life; it becomes mechanical and monstrous the moment individuals are subjected to collectivist ideals; it becomes decadent the moment law and justice are uncritically institutionalized.

Reshaping Our Philosophy.—JAMES H. TUFTS.

The national philosophy of the American people has been expressed through the three conceptions, liberty, union, democracy. These express intrinsic human values. Liberty is the indispensable condition of conscious choice and therefore of personality and any life supremely worth while. Union is not merely a source of strength, but affords the possibility of the human relationships, interchange

of thought, community of sympathy and purpose, without which life is barren. Democracy in the sense of self-government is the method of attaining fullest moral responsibility and expression; in the sense of equality it expresses the condition of genuine conversation and friendship; it is one at least of the elements in justice and is the ideal of religious visions.

These conceptions, however, need reshaping to meet the change from a predominantly political to a predominantly economic situation. Three stages may be distinguished in the development of certain powers. (1) The discovery of some hitherto unknown power, (2) Its limitation to prevent its dangerous uses, (3) General participation in the benefits, *e. g.*, (1) the discovery of the automobile, (2) measures to keep it from running over the great mass of people, (3) general ownership of automobiles. Human organization and cooperation is one of the two great sources of power. This has been applied to military and political organization in which it has come through the three stages. Our national philosophy has been shaped chiefly with reference to this. The great power at present is economic organization. We are as yet chiefly in the second stage. The problems of liberty, union, and democracy have to be restated in terms of this new situation.

In the case of liberty it is now seldom that individual liberty in any of its forms is threatened by political power pure and simple. The danger to liberty comes through the machine in industry or through control of the standard of living by organized capital or through control of public opinion by special interests not clearly understood. The problems of union are no longer geographical, but are chiefly economic and social, growing out of the divisions between capital and labor and the methods of urban life which segregate dwellings by economic status so that rich and poor no longer attend the same churches or the same schools. The great problem of democracy is due to the conflict between the principle of self-government and equality which is our political theory, and autocracy and inequality which is our economic practise. We are in unstable equilibrium.

War and the Democratic State.—L. L. BERNARD.

Herbert Spencer's assumption¹ that the increasing industrialization of the state inevitably involves the coming of democracy and the disappearance of war and of compulsory political control is not borne out by history or the requirements for a successfully organized society. Industrialism has not been followed by democracy, but there has been a marked change in the personnel of the ruling classes. The people themselves can not rule until they can secure and make use of

¹ "Principles of Sociology," Vol. II., Part V., Chs. 17-19.

accurate and abundant undistorted information regarding public affairs, organize an effective machinery of control over governmental agencies, and reorganize the machinery and purposes of the economic and social system. Governmental controls must increase rather than decrease with the growing complexity of the industrialized social order, but this control machinery should be functionalized instead of ritualized in the interests of the classes. Democracy is incompatible with civil wars and with foreign wars waged for class benefits only. Wars carried on by over-populated countries or by countries with poorly balanced industrial development against their rivals may still occur in true democracies (should any exist) as well as in class-controlled states. But for the most part the existence of a foreign war would seem to be an indication of an undemocratic state.

The Meaning of National Expansion.—M. S. HANDMAN.

Nationality is a changing and relatively indefinable entity. Neither race, language, religion, nor geography can be shown to be fundamental in the determination of nationality, as the altering political boundaries of successive periods show. What, then, is the true nation? Has it an intelligible principle of definition other than the political?

Values and Science.—GEORGE R. DODSON.

Science, strictly speaking, is physics. It is a set of concepts arising from our experience with the physical world. It is abstract and its ideal explanation is in terms of mechanics. It is vain to claim all knowledge for its domain. Some very useful knowledge is not science, and never can attain scientific character. Science implies precision, exact knowledge. This is possible only when the material studied can be weighed or measured, or when, in case of motion, there is uniformity.

When we turn from the inorganic to the realm of life, the methods of physics and chemistry are applicable only in part. New categories are needed. Biology is coordinate with physical science, not a part of it. When consciousness is studied, the data are so different that physical methods are almost entirely inapplicable. Omit from psychology all that belongs in physiology, biology, and philosophy, and it will be found that little is left. The psychologists who are wedded to the scientific ideal therefore tend to turn from consciousness to behavior. This is interesting and important, but the result is not psychology, and it means that although human consciousness can be intelligently studied, its data can not be treated scientifically.

This is still more clear when ethics, esthetics, and religion are in question. For here the data are values which are not given by the

senses. They are furnished by feeling and are known only as they are felt. They can not be studied from the outside or at second hand or from memory. Moreover, they are felt differently by different individuals and by the same persons at different times. Science can not deal with such materials. They lack definiteness and precision. They can not be studied in cold blood, for when feeling is absent the data are absent too and are known only by report.

Ethics, then, can never be a science. But this does not mean that ethical values can not be treated intelligently. Love, *e. g.*, is a feeling and it can be known only by an experience of it. It always retains its emotional character. But it can become intelligent. It can realize that it is not for fondling and indulgence only, but for the high ends of life. So with all ethical, esthetic, and religious experience. If we have it, we may reflect on it and at least partly understand it. But such knowledge is not science and it is not on its way to the scientific stage. Incommensurables will not become commensurable with time, and the values which do not exist apart from some appreciation of them can never be treated by the methods which have been so successful in physics. Of course, we may stretch the term science to include all knowledge, but the loss in clearness is great, the gain is nothing.

Justice, in practise, is not exactly ascertainable, because the values in question are felt differently by the contending parties. American and Japanese can not get together on a precise delimitation of rights and duties. What is needed is not the impersonal thinking of science, but the *personal thinking* which results in a *Lebensweisheit*, which takes account of the sentiment of honor, which goes more than half way, which engages in a rivalry of generosity. This is a wisdom which is folly to the science that consists merely of facts and cold logic, but which is the only thing that will work in class struggles and international difficulties, precisely because it is skilful in dealing with values, the only things men care for, values which are, and in virtue of their nature must remain, outside the domain of science.

Philosophy and Religion.—G. D. WALCOTT.

Religion may be analyzed into four elements, viz., (a) a background or world-view, (b) an attempted solution of the serious problems of life, (c) an emotional quality, and (d) activities of such kind as are appropriate to the belief of the individual. The relation of philosophy is especially apparent as regards the first of these elements or constituents. Religion tends to present truth in symbolic form; its world-view needs rationalizing, and to accomplish this is the proper function of philosophy. In the past a distinctively philosophic world-view has sometimes been substituted for the world-view

of the prevailing religion. Something of the sort seems to be needed at the present time in order to reconcile philosophy and religion and to secure a more adequate background for the religious life.

The Mystical Element in Experience.—C. E. CORY.

When mysticism understands itself to be in hostility to thought it is both defenseless and injurious. Current anti-intellectualisms and irrationalisms have tended to encourage that error. Further, it brings no revelation of another world, has no insight into a beyond. It may, however, take the form of an enriched and deepened perception of this world; and when thus formulated is worthy of some defense. This enriched perception of this world it secures by freeing itself, for the moment, from the tyranny of special desires. By suspending the attitude of utility it releases into all objects a larger sympathy, and thus obtains a greater immediacy. Action implies preference, and preference sunders its world—the narrower the interest, the more foreign will the world appear. The discontinuity which the desire for particular ends creates is thus overcome by an impartial love. As the unity is restored, the meaning of the whole illumines the parts. All this the mystic accomplishes, not through the dialectic of thought, but through a purification of desire.

James's Later View of Consciousness and the Pragmatic View: A Contrast.—ETHEL E. SABIN.

A criticism of James's doctrine of consciousness may be made from the standpoint of a more thoroughgoing pragmatism. James's view that objective or external relations, as contrasted with the subjective or internal, are more constant and stable, fails to recognize that stability is relative to purpose and that, when thus interpreted, the test does not enable us to differentiate between the objective and the subjective. The interpretation of cognition as control by future consequences, or the identification of thought with this function of control, was ignored by James, and hence his account of the relations or transitions constituting consciousness inevitably goes astray. His doctrine is not a doctrine of cognition, but of verification. The "leadings" or "pointings" become a series of static links, and the final fulfilment bestows an *ex post facto* function of cognition upon the starting-point. "Virtual knowledge," which achieves no fulfilment, becomes wholly inscrutable. The *terminus ad quem*, when finally reached, becomes a dumb facing of reality. The relations having been left behind, this means logically either dualism or absence of consciousness. From this situation James tries vainly to extricate himself through the concept of pure experience. The significant feature of pragmatism as a future made present escaped James,

and hence his pragmatism is, in truth, but a new name for old ways of thinking.

Object of Perception versus Object of Thought.—H. W. WRIGHT.

Influenced by pragmatism, we have become accustomed to think of perceptions as plans of action. As such they are at once anticipations of motor adjustments and promises of result, pleasant or unpleasant. These promised results are ideal qualities, universal in their meaning. The object perceived, however, is a particular thing. Its existence is quite different from that of our ideas. Reality confers objectivity upon certain of our interpretations by the control which it exercises over the movements of adjusting the sensory apparatus. If the movements thus initiated lead on to further movements, *e. g.*, approaching and touching, and if the promised results arrive, the perception is said to be verified. Similarly thought-objects find their meaning in certain sequences of movement, on the one hand, and in certain satisfactions on the other. This furnishes the basis of the contrast between mechanism and teleology or value. In the case of thought-objects the control is exercised by the accepted body of knowledge, usually through the instrumentality of the speech-mechanism. Here likewise unimpeded activity has the force of verification. But this is not the whole story, for ideal contents are universal, not only in meaning, but in existence as well. They are generalized experiences of action and appreciation; their universality is based upon the unity of will characteristic of all human individuals. Thought represents objects that are possible of realization by all voluntary agents. In the nature and workings of volition, therefore, we find the desired explanation of the opposition between conception and perception, thought and existence.

Ernst Mach and the New Empiricism.—B. H. BODE.

The difficulties encountered in Mach's philosophy have their origin in Mach's failure to adhere consistently to the requirements of empirical method. Concepts are interpreted pragmatically as instruments or tools, but sense-perception is reduced to absolute "elements," with the result that Mach wavers between the position of mental chemistry and that of plain materialism. This inconsistency makes it impossible for Mach to establish a proper relationship between concepts and sense-material. Mach does indeed furnish suggestions which, if developed consistently, would have led to the doctrine of the reflex arc concept and to an interpretation of all experience along the lines of instrumentalism. As thus developed consciousness is a form of control which appears when responses become inhibited, and the character of the control is determined by the bio-

logical result which the nascent activities would have if they were completed. While Mach did not carry through the empirical method consistently, he wrought a change in our philosophical attitude or temper of mind which secures for him a permanent place in the record of human progress.

Neo-Realistic Logic and Science.—A. W. MOORE.

Expounders of the analytic logic of neo-realism hold two very different views of its relation to science, viz., (a) that analytic logic is not a methodology, but is a special science, with its own special interest, subject-matter, and method; and (b) that it affects a long-needed reform in scientific logic by excluding the "psychological," "subjective" process of knowledge and by furnishing science with its long-sought "simple" elements. Its difficulties may be summarized as follows: (1) It accepts from epistemological logic the "subjective" character of the *act* of knowing; (2) in excluding from logic the act of knowing it breaks with science, as is seen particularly in its view of hypotheses; (3) it is unable to make a workable distinction between truth and error; and (4) the simple elements which it proposes to furnish to science are the hypostatized acts of knowing which were previously rejected and which are neither simple nor of value for science.

The Co-Functions of Meaning.—A. MITCHELL.

Read by title.

UNIVERSITY OF NEBRASKA.

H. B. ALEXANDER.

B. H. BODE.

UNIVERSITY OF ILLINOIS.

REVIEWS AND ABSTRACTS OF LITERATURE

The Limitations of Science. LOUIS TRENCHARD MORE. New York: Henry Holt and Company, 1915. Pp. 268.

The main contentions of this vigorously written and acute criticism of current scientific methods and theories are: (1) That physical science has no ontological value, and that its proper business is to describe in symbolic terms the properties common to the members composing a class of sense phenomena. (2) That therefore the truly fruitful method of science is the abstractive method, which proceeds in accordance with the above description of the genuine business of science. (3) That the hypothetical method, so much in vogue to-day among the "energeticists," the "etherists," and the "electronists," which method consists in assuming the existence of a fictitious class of objects which can not be perceived by the senses (why does Professor More call these objects "phenomena" when, by defi-

nition, they can not be perceived by the senses?), but to which there are nevertheless attributed qualities similar to those of sense phenomena, is a method fruitful of confusion between the fictions of imagination and objective realities, fruitful of manifold contradictions, and unfruitful in the promotion of scientific discoveries. (4) That the problem as to the ultimate nature of things should be left to the metaphysicians.

I am not at all clear (and I suspect that the author is not clear) as to what Professor More means by metaphysics. On the first page he seems to regard it as the subjective method of investigating objective data: "That is, things are as we think them to be." In another place (p. 188) he speaks of the unfortunate results which have accrued to men of science, when, "succumbing to the temptation to discover the hidden causes of phenomena, they have created a sort of fictitious world in which the laws of objective or physical phenomena are inextricably confounded with the deductions of subjective psychology." Thus science becomes metaphysical, and at the same time pretends to supplant metaphysics. In still another place, he seems not quite certain about the boundary line between physics and metaphysics, not quite so confident that he can tell the physicist and the metaphysician how each is to keep in his own bailiwick. Still he holds that we can say in a general way that the domain of physics is concerned with the discovery of phenomena and the formulation of natural laws based on postulates which are determined by experience and generally accepted as true; the causes of phenomena and the discussions of the postulates of science lie in the province of the metaphysician (pp. 113-114). For example, the shape of the electron is not a physical but a metaphysical problem, since it is incapable of verification by experience. In other words anything incapable of experimental verification is a proper subject for metaphysics and "subjective psychology." In short, I suppose that metaphysics is concerned chiefly, or perhaps only, with those problems concerning which nobody can really find out anything. In the language of a contemporary humorist it deals only with what is "behind the beyond." It follows, too, that psychology is not a science, unless, indeed, Professor More would admit that, besides "subjective" psychology, there is also an objective psychology. But then he defines the objective as the physical. Therefore the only "objective" psychology would be physical psychology, a bad name for physics, chemistry, and biology. It follows also that, when one wants to be a metaphysician, all one has to do is sit down with his eyes shut (if that helps him the better to extrude from his mental field the troublesome "objective" world) and to imagine, according to fancy and in disregard of the possibility of verification, all sorts of entities dancing and careering behind the veil of experience. I take it that Professor More would say that this sort of thing is quite harmless provided the genuine scientist does not indulge in it and mix its fantastic results with his science into a mass whose ingredients are indistinguishable by the layman and usually by the scientist himself. Professor More's grievance against most of the notable scientists of the present time seems to be that they are given to compounding just such mixtures. I suspect that he regards the professional metaphysician as a harmless but useless wool-gatherer. It

seems truly unfortunate that great physicists can not curb their metaphysical impulses.

Professor More complains with much justice that physical theorists have not been schooled in philosophy sufficiently to know when they are off or on their own beat. I think that the complaint applies to the author. His conception of the scope and method of metaphysics is both antiquated and naïve. Those of us who still regard metaphysics as a serious pursuit for some intelligent beings look upon its business as that of investigating the fundamental postulates and general results of the special sciences and of arriving at the maximum of coherent and synthetic interpretation of reality, *as found in experience*. Metaphysics has to do with the most general and fundamental characteristics of the objective or existent world. Logically anything which exists is an object and a proper subject of scientific, that is to say of systematic, inquiry. Professor More's treatise is on the epistemology of physics. Now, if one is going into this field, and a very important field it is, one should formulate clear conceptions of the meaning of "object," "objective," "subject," "subjective," "reality," "existence," etc. These terms are notoriously dubious and equivocal in common usage. Psychology has to do with psychical subjects or minds, but it does not follow that psychology consists of a lot of subjectivistic imaginings or guesses. Physics has to do with physical or spatial objects, but it does not follow that all its so-called phenomena are epistemologically or really objective. Professor More seems to forget that every physicist is a human being with sense-organs, brain, and even mind, a good deal like the rest of us. Was it not the Blondlot rays that leading French physicists saw, but that Professor Wood and others could not see at all? One might suppose from Mr. More's argumentation that speculating and guessing never really led to fruitful observations and discoveries.

I would not have my criticism of Professor More's naïveté in philosophy, and especially in epistemology and methodology, detract from the impression of the instructiveness to the student of the philosophy of science of his critical exposition of "The Metaphysical Tendencies of Modern Physics," "Descartes and his Influence on Recent Science," "The Scientific Method," and "The Classical and the New Mechanics." These chapters abound in interesting matter. He keeps steadily in mind his general theses, and, by wealth of illustration and clearness and vigor of statement, he makes out a strong case on the inconsistencies and speculative difficulties of recent physical theory. He has no difficulty in showing up the inconsistencies and weaknesses in recent conceptions of the ether, the atom, the electron, matter, and space. The hypothetical method of the new mechanics, he points out, makes mechanical mass or inertia a phenomenon of energy, and, indeed, of electricity. The latter in turn becomes a property of the ether, and the ether, in turn, evaporates into empty space or becomes a pure vacuum. The electromagnetic theory of ether, in its latest developments, implies that light has the power of changing a vacuum into a substance. In fact ether is hardly intelligible except as a mathematical symbol. Professor More thinks that the time is rapidly approaching when all scientific discussions of the nature of the ether will

be considered futile. "If bodies are forms of electricity how can they move through an electrical medium without disturbing it?" "We are driven (by the Larmor and Lorentz theories) to the supposition that the electron is a space modification of a universal medium and that, in some way, neither electron nor ether is a material substance, but a kind of transcendental entity called electricity." "If motion increases mass (as the new mechanics assumes) then mass becomes infinite when the velocity of light is reached." "They (Larmor and Lorentz) have really only substituted an electrical atom which will not explain matter for a material atom which would not explain electricity." "The Fitzgerald-Lorentz hypothesis, made to explain the Michelson-Morley experiment, namely, that the dimensions of bodies were so changed by their motion as to neutralize the effect of the earth's motion on the phenomena of light, would mean that every body when it attained a speed equal to the velocity of light, would flatten out to a disc of no thickness at all." These are specimens of his criticism. Professor More stoutly maintains that "we have no conception of matter without energy or of energy without matter." Ostwald's question as to which we feel first when a stick strikes us, the stick or the energy, he says, is as wise as the question which comes first, the egg or the chicken. His criticism of Einstein's relativity theory, which does away with ether and postulates space as a vacuum, the velocity of light as an absolute constant, and time as simply synchronism not the experience of succession, seems to me, as a layman, particularly telling. He says that Einstein's definition of time gives him the feeling that, if he could make clocks go slower his life would become longer. (Einstein's theory is, of course, a beautiful illustration of the confusion between time conceived in terms of a recurrent or rhythmic spatial motion and actually experienced time as succession or duration.) The whole discussion of the attempt of the electronist to make mechanical mass and gravitational attraction phenomena of electric charge deserves careful weighing. As well, also, the discussion of the game of hide and seek between matter, energy, space, and ether in present-day physical speculation.

In short, Professor More has no difficulty in showing that these concepts are used by physicists in very fluctuating senses, and that, if they are to be taken as representing real entities, then physical theory becomes involved in a mass of inconsistencies.

Such is the danger which besets the wholesale employment of the hypothetical method. Therefore, says Professor More, let us abandon it to the professional metaphysicians. The danger is real, and the despised and rejected metaphysician will not be able to repress an unholy glee at seeing the votaries of exact science floundering in metaphysical morasses. But I respectfully suggest that the remedy proposed is too drastic. I doubt if the impulse to form hypotheses and make guesses as to the real "go" of things can be expunged in this fashion. I suggest that a good dose of philosophy might enable the patient to eliminate the toxins due to overindulgence of the "metaphysical" appetite. Is it not your second or third rate physicist who regards the atoms, electrons, and ethers, as indubitably real existences? If a first-rate physicist does so, I submit that

it is because his philosophy is so very naïf. Is it not the case that the minds most fruitful in scientific discovery, such as Darwin's, Faraday's, Kelvin's, and Thomson's, are always fertile in hypothesis? Are not hypotheses for them policies and programmes, incitements and pointings to further investigations? If this be true, then there must be some psychological and logical connection between imaginative construction and discovery. If physicists were to resign all attempts to picture or conceive the inner go or hang of physical processes, and severely restricted themselves to methods of abstraction would we not get a race of pedestrian recorders and measurers, piling up observations unenlightened by any far-reaching and unifying synthesis? I remember that Simon Newcomb once said that this sort of uninterpretive amassing of facts was the bane of American science. Consider the extraordinary fertility of Darwin's and Faraday's minds! Consider the stimulating effects of the molecular theory of gases, the wave theory of light and electricity, the theory of natural selection, and of Thomson's and Rutherford's speculations on radioactivity! It is surely a most significant coincidence that the pioneers in investigation are always fertile in hypotheses. What is a hypothesis, after all, but an intellectual scheme or picture for correlating facts and impelling a man to look for new facts?

Professor More's argument has not convinced me of the valuelessness or the terrible dangers of the hypothetical method. It is the expression of a native impulse of the human mind, the impulse to seek to see deeper into the interrelationships of things, to trace analogies and find correlations, which is at work in different guises in the scientist, the philosopher, and the poet. Rightly employed, it leads to the discovery of new facts and new relations between facts. To crush it out would be to reduce science to a process of routine registration of routine perceptions.

Is it, after all, so scandalous a thing that Kelvin, Faraday, Thomson, Lorentz, *et al.*, while they proclaim themselves to be devotees of purely objective science, indulge rather freely in metaphysical flights so bold that your philosopher, browbeaten by the contemptuous severity of the scientific positivist, would never have dared to essay them? Professor More's ideal of science seems to be the same as Auguste Comte's, and he, of course, banished metaphysics—and smuggled it in again as the Worship of Humanity and the Eternal Feminine. When the philosopher sees that the speculative physicists are leading the field, he takes heart of grace and ventures to suggest that he does not wish to deal in transcendental moonshine, but only to carry out farther (as far as may be) the work of synthetic correlation of the main features and directions of this empirical and moving old world. Perhaps physics is not so sternly objectivistic and philosophy so riotously subjectivistic as the blatant scientific positivist has been shouting.

I ought to mention, in conclusion, that Professor More has a sharp and telling criticism on Sir Oliver Lodge's vagaries and on the grossly exaggerated pretensions of so-called scientific methods of handling the social problems of eugenics, the latter under the caption "Science as Arbiter of Ethics." The whole book is thoroughly worth while.

THE OHIO STATE UNIVERSITY.

JOSEPH A. LEIGHTON.

Geschichte der französischen Philosophie seit der Revolution. Erster Band. *Die Anfänge des französischen Positivismus.* Erster Teil: *Die Erkenntnislehre.* MAX SCHINZ. Strassburg: Verlag von Karl J. Trübner. 1914. Pp. xii + 266.

The French thought of the later eighteenth century has commanded comparatively slight attention on the part of the historian of philosophy. Yet, in spite of the encyclopedic superficiality and the lack of technical grasp which characterize so much of French thinking during that period, some of the intellectual prophets of the French Revolution have made positive, lasting contributions to philosophic knowledge and method. In this first volume of his history of French philosophy Dr. Schinz points to D'Alembert, Turgot, and Condorcet as the predecessors of Auguste Comte and the founders of French positivism. In their work he recognizes a philosophical tendency of Lockean inspiration, paralleling the critical philosophy in rank as well as in time, and indeed in some respects anticipating and even transcending Kant and the Kantians.

This volume, dealing with the epistemology of D'Alembert, Turgot, and Condorcet, begins with biographical-historical sketches of the three men, obviously more detailed in the case of D'Alembert and of Condorcet, and particularly enlightening in the somewhat intimate delineation of the latter as a leader in the Revolution, the creator of republican, constitutional theories in France, and the opponent of the demagogic dogmatism personified in Robespierre. The rest of the book, while constantly taking account of Turgot's and Condorcet's theories of knowledge, naturally centers about the epistemological method of D'Alembert and his doctrines concerning the objects of knowledge. These the author regards as the first statement of French positivism, which tendency in philosophy he misses no opportunity to compare and contrast with the critical philosophy and with English positivism.

It is significant that D'Alembert's "Éléments de philosophie" appeared in the same year in which he gave up his position as editor of the "Encyclopédie." Dr. Schinz sees in this step of D'Alembert's an indication of his estimate of philosophy, as not merely a weapon against ecclesiastic and political dogmatism, but above all an endeavor to separate opinion from knowledge and to give the latter a firm foundation.

The subject-matter of philosophy D'Alembert finds in the first principles of the sciences, these being simple and recognized facts: simple abstract ideas and ideas of sense. The former correspond to the Cartesian concepts; but, unlike Descartes and Malebranche, D'Alembert considers them, not as innate, but as evolved by the reflective understanding. The manner in which abstractions originate becomes a problem for Turgot, the author of the law of the three stages, who regards the forming of a complex of relations as the essence of the abstraction process. All our knowledge is relative, that is to say, it is limited to phenomena. The more nearly philosophy succeeds in recognizing in the mass of experience-data one fact, and in the mass of abstract ideas one truth, the more nearly it attains its goal. Like Kant, French positivism seeks to discover and to analyze the categories in accordance with which the world of our experi-

ence is organized into coherent unity. For D'Alembert's unity of all reality remains an ideal which philosophy can only approximate, but which it can never attain. The attitude of philosophical resignation is in marked contrast with that of Descartes and Leibnitz regarding the ultimate reach of knowledge.

The second part of the volume, entitled *The Object of Philosophy*, deals with the problems of our own existence and the relation to the outside world. D'Alembert's discussion of the existence of God in the Introduction to the "Encyclopédie," is compared with the views of British empiricism, especially those of Hume and Berkeley. The criticism of Berkeley receives some attention. A chapter on Condillac, and in the analysis of Turgot's article on the relation of the mind to the body, an interesting parallel is drawn between Turgot and Kant.

One readily sees from the very outset how highly this French triad of thinkers, and how seriously he regarded the task to remove the veil of misunderstanding which has obscured the usual accounts of their philosophical theories, and to place them in their proper historical setting and their real philosophical significance. Dr. Schinz has brought to his work abundant enthusiasm and erudition. To be sure, the insistence with which he seeks to apply Kantian wisdom in D'Alembert's and Turgot's philosophy exposes him not infrequently to the dangers of the same higher criticism which has loaded many thinkers of the eighteenth century with charges of which they very probably were quite innocent. But because of the author's firm determination to show the importance in the history of philosophy of these early French philosophers, and of the rather slender philosophical material with which he has provided him, this volume, entitled "*Erster Teil: Die Philosophie der Aufklärung*," may be said to suffer from padding. If the author's treatment is clear and occasionally even happy, it is not on that account that a reviewer is aware of the fact that the indication of the place of these philosophers in the history of philosophy, in which D'Alembert, Turgot, and Condorcet stand with the French philosophy, and more especially with respect to the relation of the mind to the body, is an essential part of the work. But the lengthy and repeated exposition of the common ground of the French philosophy and the critical philosophy, and the criticism of British empiricism add to the bulk of the book without increasing its value. None the less, this volume is a real and worthwhile contribution to the history of a somewhat neglected period in the history of philosophy.

RADOLPH

THE RICE INSTITUTE.

JOURNALS AND NEW BOOKS

THE PHILOSOPHICAL REVIEW. January, 1901. *Potency of Thought in the Sphere of the Higher Life*. By J. H. SCOTT. — In view of the supposed conflict between philosophy and science as a conflict between thought and emotion, the quest-

anything which can vindicate itself as intellectually true can do the work of religion. The absolutistic analysis of thought is accepted and made the basis of religion. Absolutism is the truth in religion, while religion is the feeling of it. *On Certain Logical Paradoxes* (pp. 16-27): THEODORE DE LAGUNA. - A consideration of the well-known paradoxes cited in the first volume of Whitehead's and Russell's "Principia Mathematica," an examination of the "theory of types" therein devised as a solution with the conclusion of the unsoundness of its reasoning, followed by the writer's alternative solution. *Instinct and Sentiment in Religion* (pp. 28-44): WILLIAM K. WRIGHT. - "It will be the purpose of this paper to show that while there is no religious instinct, in the strict sense of the word, there is a religious sentiment which develops from the instincts, partly in accordance with innate characteristics, and partly in response to the social environment." *Bergson's Doctrine of Intuition* (pp. 45-58): C. A. BENNETT. - In the face of divergent interpretations of Bergson's doctrine of intuition, an attempt is made to present a self-consistent view. It touches the question of the relation of instinct and intellectual analysis. The answer is that richness of intuition depends on the amount of analysis which has preceded it. "Intuition without analysis is dumb and empty; analysis without intuition is fragmentary and unfinished." *Reviews of Books*: Hugo Münsterberg, *Psychology, General and Applied*: MADISON BENTLEY. Benedetto Croce, *What is Living and What is Dead of the Philosophy of Hegel*: G. WATTS CUNNINGHAM. Professor Aliotta, *The Idealistic Reaction Against Science*: JOSHUA C. REYNOLDS. J. Chevalier, *La notion du nécessaire chez Aristote et chez ses prédécesseurs particulièrement chez Platon*: G. S. BRETT. *Notices of New Books. Summaries of Articles. Notes.*

Dunlap, Knight. The Results of a Questionary on Psychological Terminology. The Johns Hopkins University Circular, No. 5. Baltimore, Md.: The Johns Hopkins Press. 1916. Pp. 55.

Pekelharing, O. Kant's Teleologie. Groningen: P. Noordhoff. 1916. Pp. vii + 243.

Pratt, James Bissert. India and Its Faiths. Boston and New York: Houghton Mifflin Company. 1915. Pp. xv + 483. \$4.

Sellars, Roy Wood. The Next Step in Democracy. New York: The Macmillan Company. 1916. Pp. 275. \$1.50.

Taft, Jessie. The Woman Movement from the Point of View of Social Consciousness. Philosophic Studies from the University of Chicago, No. 6. Chicago: University Press. 1916. Pp. ix + 62. 50 cents.

NOTES AND NEWS

THE General Board of Studies of Cambridge University has published a report to the Senate on the desirability of instituting degrees, other than the doctorate, to be given for original research; the board is of the opinion that the present is a favorable opportunity for instituting a more distinctive recognition of research work than is at present available. Two classes

of student have to be considered: first, that composed of graduates of the University; and, secondly, that consisting of graduates of other universities who may, under the present regulations, obtain the Cambridge degree by two years' research work carried out in the University. The board recommends that the degrees of Bachelor of Letters and Bachelor of Science be established; that a Bachelor of Arts of the University may, in or after his eleventh term, submit for approval a dissertation upon original research for the degree of Bachelor of Letters or Science; that a research student who is not a graduate of the University may submit a dissertation upon original research for one or other of the new degrees after six terms' residence. It is also recommended by the board, although with dissents, that holders of the new degrees may proceed to the degree of Master of Arts in the same manner as do Bachelors of Arts at present.—*Nature*.

THE first two numbers of a new bi-monthly magazine, *The Journal of Delinquency*, have appeared under the editorial guidance of Frederick C. Nelles, superintendent of Whittier State School, and J. Harold Williams, director of research in the same institution. Associated with them are Arnold L. Gesell, of Yale University; H. H. Goddard, Training School, Vineland, N. J.; Thomas H. Haines, of the Ohio Bureau of Juvenile Research; William Healy, of Chicago, and Lewis M. Terman, of Stanford University. As its name suggests the journal will be devoted to the scientific study of problems related to social conduct.

THE Honorable Bertrand Russell, of Trinity College, Cambridge, has been convicted under "defence of the realm act." Under these circumstances the government finds it impossible to issue a passport to him to leave the country. Accordingly, his lectures at Harvard scheduled for next spring must be postponed until another year. Professor Royce will resume his own course on symbolic logic.

DR. FREDERICK G. BONSER, associate professor of industrial education in Teachers College, Columbia University, has been promoted to a full professorship of education and given charge of the courses concerned with the elementary school curriculum. Special attention will be given to the needs of supervisors of vocational and rural schools.

DR. HORACE C. LONGWELL, assistant professor of philosophy in Northwestern University, has been appointed assistant professor, preceptor in philosophy in Princeton University.

DR. DONALD W. FISHER has been appointed instructor in philosophy in Princeton University.

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

BELIEF AND THE CRITERION OF TRUTH

IN a previous article in this JOURNAL, I attempted to justify a familiar definition of truth—that of correspondence between idea and reality. The chief practical interest which we have in the truth problem, however, has to do with a further matter—the question of the standards which enable us to separate truth from error. It is no objection to a definition that it does not do this. All that it professes to do is to tell us what we mean by calling a thing true, a meaning which is present whether we are right about our belief, or mistaken. In order now to get to the more practical matter of a *standard* of truth, I should like to retrace my steps and approach the problem from a somewhat different angle. And I should be glad to start off with a preliminary statement so simple and self-evident that it could be accepted by everybody. But since this is hardly to be expected in philosophy, I shall do the next best thing; I shall take what is to *me* the simplest and most self-evident proposition I can hit upon. The preliminary definition is this: Truth for me is that which I can not help believing. To make clear what I understand by this will perhaps take a little explaining.

I say that I do not see how any one can refuse to accept this proposition so far as it goes. Certainly that which I do *not* believe I can not in any intelligible sense call true; this would be to empty words of all accepted meaning. And everything that I really *do* believe must come under the head of what I call the true. The main question would seem to be about the words "*can not help believing*." This limits the field somewhat, as indeed it is intended to do; for we are engaged on a philosophical inquiry, and what we are after is not anything that may *seem* true, but what approves itself as true to the persistent inquirer. If we simply *believed* things, the problem of truth would not yet exist. It is because we discover that a number of things we have believed do not retain our belief, but turn out false or doubtful, that we set out to hunt for some standard truth, which is *really* true. My statement in the first place is intended to presuppose this situation, and to identify real as distinct from mere temporary and apparent truth, with what we per-

sist in believing after doubt and inquiry, that which we find ourselves unable to get away from no matter what the skeptical temptations. If the objection is made, therefore, that many things are held to be true the belief in which might very well be shaken, I reply that so long as we do not examine our beliefs critically this is the case; but I am considering the situation where we do examine our beliefs critically. Suppose, then, I find myself *genuinely* able to doubt a pretended truth—not simply to think of myself in imagination as doubting it; can the thing still belong to the category of the true? Evidently not; it belongs to the doubtfully true, or that about which I am in doubt whether it is true. It might be said that I can still determine that it shall be held true by me by an act of will. But this means, either that the doubt still persists in my mind, in which case I do not believe it true, but merely want it to be true, or act as if I believed it true; or else by my act of will I succeed in forgetting the doubt, excluding it from my mind. Then real belief indeed returns, but only because I have excluded *myself* from the field which we are setting out to examine, and have gone back voluntarily to a naïve and pre-philosophic state.

With this preamble, I may go on to point out certain implications in the statement, and thereby begin to make it more specific. In the first place, it implies that *belief* is a more fundamental concept than *truth*. We have, in other words, to start with the psychological existence of a certain peculiar attitude of mind, not with a reasoned definition or an objective fact. We have the belief before the question of truth arises at all, and we have to go back to the fact of belief to determine whether any truth is left at the end of the inquiry. If it is not—supposing such an outcome to be humanly possible—then we are skeptics, and truth for us does not exist. If, on the contrary, we still find ourselves believing, it is not that we have discovered standards of truth which independently produce the belief, but rather that the beliefs left in the field are what we have to examine in order to discover in them the marks which we then erect into a standard. And even if we do not succeed in analyzing them sufficiently to elicit the standard, we should still hold that the beliefs represent truth.

This leads to a second point. When I say that truth is what we can not help believing, I do not mean simply what it is *logically* impossible not to believe, or what can not be believed without self-contradiction, but what it is naturally, or physically, or morally, or practically, impossible not to believe. It is what as a matter of fact we actually do believe, irrespective of what the reason may turn out to be, or even whether any satisfactory reason can be found. We should be in a hard case indeed if mankind before believing in truth

had to wait for the philosophers to define its nature and conditions. And what particularly I wish to repudiate, in a preliminary definition, is, as was indicated above, the assumption that we have no such thing as truth, or knowledge, until we get what can meet the test of *logical* certainty. This has actually been the assumption quite generally in philosophy, and it has had unhappy consequences. By setting up a goal extremely difficult, at any rate, to attain, if not actually impossible, it has tended to widen the gap between theoretical and practical truth, and has left a general impression in philosophy of skepticism, quite out of relation to the concrete history of the growth of human knowledge. When we find mankind assured of the possession of a great deal of knowledge which the philosopher asserts is not knowledge at all, it would seem more modest, as well as more fruitful, if philosophy were to modify its definition in the direction of common usage, instead of setting up an *a priori* definition of its own, and then condemning actual human knowledge because it does not measure up to this. My own point is that the feeling of certainty, of settledness and assuredness, when this is not dogmatic, but is ready to lay itself open to all the evidence at hand, ought to be taken in the first instance as the sign that we are in possession of truth. If we actually have this, and continue, after open-minded criticism, to have it, where the logical test can not be applied, that means that we have no right at the start to identify the logical test with knowledge, and to demand that it must be met before we as philosophers are satisfied. If as human beings we are satisfied without this, then philosophy must accept the fact as part of its data. And that men are thus capable of being satisfied is shown by the standing fact, frequently a matter of perplexity to the philosopher, that the belief in an outer world, or in the independent existence of our fellows, or in the obligatoriness of the moral law, survives with hardly an effort the most overwhelming critical assaults.

Another explanation is perhaps needed in connection with the words "for me." A certain difficulty, it may be admitted, lies here, which can hardly be disposed of briefly. But if we are willing to stick for the time being to words as they are commonly understood, it is not difficult to make all the distinctions immediately relevant. The most direct source of confusion is that between "truth for me," and actual or objective truth. That this may stand for a genuine distinction I should be myself the first to claim. Purely on the ground of experience, it is obvious that I may at least have at one time a conviction of truth which afterwards I may lose. But our common interpretation goes further than this; it makes a difference not only between the feeling of truth now and later, but between the feeling or persuasion of truth and the real truth *now*. It holds that

whatever my belief in the matter, a thing is really true or not true all the time; that there is an objective truth of fact, to which the personal belief may or may not correspond. In saying, then, that truth *for me* is what I can not help believing, I do not mean to imply that truth in the so-called objective sense is limited by my psychological beliefs. On the contrary, in every belief there is present the assumption of a validity which does not depend on the belief itself, but on objective conditions. All that I mean is that, whether the belief is justified, or is a mistaken one, every truth that we actually have up must first be believed to be true by some man in particular; and therefore, for human purposes, it is impossible to separate what is really true from what is believed to be really true, and get at the former apart from the belief. The fact may be one way or the other, or it may be something quite different from what has ever entered into the mind of man; but it becomes a matter of human inquiry and human dispute only as it is the object of a belief. Reality, as it presents a definite content that we can talk about, is subject to all the vicissitudes of human thought about reality. "Truth for me" means, therefore, not that reality is necessarily what it is believed by particular human beings to be, but that man can get to a knowledge of reality, not by *being* it, but only through belief about it; and while belief always supposes that it has got at the actual facts, we know that this supposition is not always correct. From such a possibility of mistake we, as human beings, can not get away. No man, not even the absolutist philosopher, is able to get round the fact that any statements which he makes are after all *his beliefs* about things; they enter the field of discussion as reality interpreted by *him*, a private individual. Truth, in other words, is a term that belongs primarily to the realm of human thought about reality, and had better be confined to this. If, then, we intend to mean what I just called, somewhat loosely, objective truth, it would be better to use rather the term objective reality, or fact. Objective truth in this terminology would only mean statements that are *really* true; the word "objective" is therefore superfluous, since all truth supposes itself really true,—contains, that is, a reference to reality which it assumes that it is adequately describing. That it is sometimes mistaken, is due simply to the fact that it is man who talks about truth; and man is not infallible.

The problem of the criterion of truth is, accordingly, this: What, on reflection, justifies us in *continuing* to hold to our confidence in the things we believe to be true? And the problem divides itself into two parts: First, what are the original sources of belief? and, second, what is the test which we apply to strengthen our confidence, or justify it *rationally*, when for any reason it shows signs of failing?

The first question I shall attempt to answer here only very briefly. There are two forms of primitive, or intuitive, belief—belief, that is, that rests on its own bottom, and does not depend upon security borrowed from other beliefs. There is on the one hand intuitive *certainty* in the stricter sense, where confidence depends on the immediate seeing that a thing is self-evidently so. But this, I should hold—I have not the time to justify the thesis here—applies only to the immediate perception of the existence, or the meaning, of our own mental content. This it is apparently which gives the *type* of certainty, and, perhaps more or less unconsciously, affects the philosophic demand for an infallible standard; but the range of its application is so limited that it can almost be disregarded in significant problems. The second is represented by such things as these: the confidence that my geometrical intuitions apply to a real spatial world, or that my logical demands are accepted by reality, or that events actually were as I remember them, or that my sensations give me information about actual things and forces. None of these is capable of the same kind of certainty; and our belief must therefore come from some other source.

The source is, I judge, reducible in every case to the implicit faith we have in our own nature and instincts. There are tendencies in various directions which are just what we mean by ourselves, and from whose influence, therefore, we can not normally get away; and belief is just the conscious side of that persistent active direction of attention which no obstacles can effectively shunt off. And there are three forms which human nature takes in its work of influencing primitive belief; it is to be remembered that I am considering for the moment only the starting points of belief, which must be presupposed before confidence can either be strengthened or weakened by the subsequent application of criteria. There is confidence due to our intellectual nature, our practical needs, and our emotional preferences. That these represent actual occasions of belief—I am not at present arguing that any of them are justified—it appears to me is sufficiently established by pointing to familiar facts. The most fundamental source of belief is trust in our intellectual constitution. That there is such a constitution—ways of the mind's working that are a gift of nature—I take it that any reading of evolution must show. To think at all we have to accept our human ways of thinking; and that men do accept them, and place confidence in their own intellectual make-up, is a plain matter of fact. It seems to be so, however, that this is a general ground for believing at all, rather than a source for beliefs in particular. It represents a condition back of any and every belief if it is to be held valid, and so may furnish a reason for rejection; but it does not of itself constitute a

positive ground of justification for any alternative in particular. It says only, for example, that it is impossible to assert and deny at one and the same time; it does not say which of two contradictories should be accepted, or tell us anything about the actual compatibility or incompatibility of things.

The second aspect of man's nature, his practical needs, also, I take it, is self-evidently a source of belief. Man can satisfy the needs of his organism only by taking for granted, and utilizing, the physical world in which he lives; and that the strong practical assurance he has of the existence of this environing world is connected with his absolute need of accepting it if he is to continue alive, seems pretty plain. There has not been so general a philosophic justification of this belief. It is not difficult to throw doubt upon it if we elect to keep to purely intellectual considerations. So while almost all philosophers agree to trust man's intellectual nature, very many have hesitated to trust his practical nature; and the practical source of the common man's belief in an external world has been thrown out of court. But the fact remains that such arguments have entirely failed to eradicate the belief, either in the non-philosophic mind, or, it is likely, in his better moments, in the philosopher himself. Accordingly, as a real and persistent belief it has to be taken account of in our search for truth; and the fact that abstractly it reveals the same basis as in the former case—confidence, that is, in the root demands of human nature—ought, it might seem, to be a little in its favor.

The third source in human nature, emotional demands, has a still poorer standing in the philosophic world; and here the philosopher gets some support also from the more cautious layman, who sees that beliefs due to emotion or desire are peculiarly liable to go astray. At present, however, I am simply pointing to the fact that desire and feeling do notoriously tend to carry belief in their train; and their influence is so far-reaching and insidious that even the philosopher on his guard against it does not escape. The very effort to escape has its dangers; a man will almost invariably be found leaning a little backward through his desire not to be influenced by desire. And if we really can not escape the influence without super-human powers, it might seem the more sensible course to include this, too, in our theory of belief, and so of truth, since, again, if human nature is the source of belief, any ineradicable element of human nature may be expected to play a part.

So far no answer has been attempted to the question, How, when belief wavers, are we to go to work to give it a reflective or rational justification? It is highly important to remember again that belief must already exist before this question can be asked, and so that

there must be a first and ultimate source of truth which is pre-rational. But equally it is clear that mere immediate or instinctive belief is not enough for human beings. Such belief needs to be emphasized in its proper place, in view of the strong metaphysical temptation to overlook it, and to reduce everything to logic. But for our ordinary purposes it can be taken for granted; the main interest lies in the further question, How can beliefs be *justified to reason*, so as to separate out the sheep from the goats?

The answer I should give to this is the familiar one of coherence. Coherence I should reject as a sufficient definition of truth, or a sufficient reason for belief. But with belief presupposed, it does seem to me the only test by which we can justify belief to the intellect, outside the very insignificant field of intuitive certainty as before defined. This does not necessarily mean that we ought to abandon all beliefs that we can not so justify; nature may be too strong for us. But nevertheless we do find on the whole that rational belief is the better and more satisfying sort; and so long as we play the game of reason, and profess to have passed beyond the first naïve and non-reflective stage of experience, the meaning to *justification* is inclusion within a coherent system.

The ground for this does not, however, lie in the fact of logical necessity taken by itself. The essence of the coherence criterion is not certainty of logical deduction, but consistency of fact or experience. Mere logic never by any possibility can add more certainty to the conclusion than existed in the premises. Its ideal is, therefore, to carry back proof to more and more general premises, until at last it finds something certain in its own right on which it can rest, and from which then a derivative certainty passes to the consequences. The ideal of *system*, on the contrary, implies that certainty grows continually as new facts are added. Accordingly, the simple elements most fundamental in our system are not self-evident truths, which refer only to mental content, but, rather, those intuitions, or immediate beliefs, which are expressions of faith, since these alone lead us to reality in the large sense. But these, although they are objects of natural belief, are not yet *rationalized* or intellectually justified belief; when we are led to reflect upon them—which means that their mere instinctive operation is no longer sufficient—they are seen to need a further support through reason—as self-evident truths do not. The conclusions, that is, have to be more certain than the premises. And the possibility of this depends, again, not on logical deduction from the self-evident, but on a *coincidence* of evidence. In other words, when we see that two independent beliefs corroborate one another, the confidence we have in both is increased; and this is what we mean by their intellectual justification. For this to hap-

pen, logical processes are required, because to reinforce one another the two must come in contact in a connected system. But the essence of the validation lies not in the passing on of an equal measure of certainty due to the process of inference, but to the *increase* of certainty due to the confluence of evidence.

This applies to what I have called the laws of the mind in the very general sense that, by working along the lines which they set, we find that we do succeed within limits in ordering the universe of experience. The probability that a special type of mind is fitted to reality, which to an outside observer must seem in the abstract highly dubious, is to us, as insiders, almost a certainty, since we come to the question already with an immense amount of evidence at hand in the shape of successful experience. The material of experience, which, in some interpretation, comes to us palpably from independent sources, nevertheless allows itself to be organized; our minds approve themselves by turning out to be perfectly good tools for helping us to make our way in the world. This never gives theoretical certainty; it is possible that we may just happen to have got along so far without disaster. But we have enough for *practical* certainty; and the ground for this, once more, is to be found in the combination of a naïve tendency to accept what our nature impels us to accept, with the logical justification which this gets in proportion as experience proves amenable to our intellectual interpretation.

The justification of our practical persuasion is represented in the experimental methods of science. The greater the number of facts, obtained independently through the senses, which fit into the more or less hypothetical schemes of the various sciences, the stronger the confidence in, and sense of logical justification for, these schemes. The outcome of experiment is not simply to prove that the investigator was right in expecting some particular result to turn up, though this is all it proves with certainty. His meaning was not that this particular future event would happen, but that the fact of its happening verifies a certain constitution of reality held to be responsible for it. Here also, to have its logical value, there must be a belief presupposed which is to receive verification; otherwise the new fact simply happens. Fulfilled expectation would have no logical force unless there were a presumption of law prior to the mere facts of experience in detail. This presumption is given in the law of causation as a practical postulate, or an intellectual principle having its basis in the necessities of our practical nature. The world being what it is, unless an organism had, ahead of actual experience, a tendency to look for repetitions of experience, and to act as if uniformity existed, it would stand little chance of surviving. The law of causation seems to be the translation into terms of the intellect

of this habit of expecting the familiar. But while as a postulate, or implicit belief, it precedes experience, as a *justified* belief it gets its standing from the fact that nature is on the whole inclined to bear it out.

The most controversial side of the situation is in connection with the postulates of emotion or desire. That these do actually influence our belief is plain. That they are as genuine a part of human nature as the elements which have already been accepted as legitimately swaying belief is, most people would grant, also true. Why then should there be so much hesitation in allowing them equally a theoretical right in the matter?

The reasons are apparently of two sorts. First is the familiar empirical fact—a part of the system of our world of facts, therefore—that beliefs influenced by feeling or strong desire have, where it is possible to verify them, so often been proved to be in the wrong; and, second, there is the tendency which emotion shows to attach itself to matters where proof and disproof are alike impossible or very difficult, and so to evade the tests that elsewhere have been found useful in keeping belief within safe bounds. Both these facts have to be recognized, but they ought not to count for more than they are worth.

The first objection implies that the case against feeling is not *a priori*, but empirical. There is nothing in it to make us reject outright the claim of any tendency to belief which is grounded in human nature, but only beliefs in whose case there are, and in so far as there are, positive grounds for doubt. If we are to begin doubting wherever there is a logical chance for doubt, without regard to reasons for doubt in particular, we are certainly on the way to a complete skepticism. We have to ask, then, why it is that emotional beliefs are so provocative of doubt; what is the positive case against them? And to this the answer seems pretty clear. Emotion is apt to be misleading, not because the thing we believe in is something we want, but because wanting it is apt to affect our mental processes and prevent us from looking at the facts just as they are. If emotion did not blind us and keep us from straight thinking, if it did not lead us to overlook and close our minds to uncongenial evidence, I see no special reason why the fact that the object of belief is something we desire should constitute the least drawback. On the whole, in view of a number of considerations, the presumption that the universe has some favorable relation to human desires and possibilities seems quite as easy to make out a case for, as the opposite assumption that between our human demands, and the constitution of the world, there is absolutely no relevant connection. Doubtless the facts are not compelling, and a good

deal depends upon the attitude in which we approach them; but my point is that an unfavorable impression is just as likely to lead to a bias as a favorable one, especially in view of that subtle temptation to adopt a non-humanistic preference because it is not quite the popular opinion, and so ministers a little to one's spiritual pride. The real objection to the emotions is not that they are at work, but that they are at work *surreptitiously*, and so produce effects that are incalculable. The trouble is not that we reason in terms of emotional objects, but that we reason in emotional ways, and so can not get these objects in their proper perspective. If, accordingly, it is possible for a man, as it surely is to a very considerable degree, to include his own desires within the field of his reason without being bound therefore to adopt of necessity a blind and prejudiced attitude toward them, if I can estimate the claims even of what I want impartially and without ignoring considerations on the other side, the positive ground for suspecting emotion would have been removed without prejudging the entire case.

The remaining difficulty, therefore, would be that the beliefs are capable of no further test. Even if this were so, it is conceivable that they might prove to be ineradicable; I should agree, however, that in such a case their intellectual standing would not be very satisfactory. But at the worst, it is to be noticed that this very fact will prevent them from being left *wholly* without intellectual justification. Thus a man, without being able in any other way to give reasons for an emotionally satisfying belief, might very well, and probably would, justify himself to this extent: The very strength of my unreasoning belief, he will say, and the fact that it persists against discouragement, is proof to me that it must be justified, though I can not see how in detail; for whenever I find such persistency in nature, I have reason to hold that it must be rooted somehow in reality. It is to be noticed that a man has a right to this attitude only in case he has not allowed his desire to blind his eyes, but has actually put his belief to the hazard of the unfavorable evidence, and shown by experiment that it holds its own in the face of this, and so that its persistence is not due to its being sheltered artificially from danger. But this granted, the conditions of the rational criterion have been met. It is not simply that the belief exists; its existence has been *justified*, and justified by being brought inside a larger system of facts. It may be its emotional source in human nature which gave strength to the original belief; but that which grounds the secondary judgment that it is a *justified* belief is the fact appealed to, that the universe is such that it does not give rise to persistent demands which it is not prepared to gratify. This may not be a convincing argument in the case in hand; but it is in

character, nevertheless, a rational, and not a merely emotional justification.

Whether we can go beyond this very general justification can hardly be answered except by considering in detail beliefs in particular. But it may be noted in a general way that the attempt at justification may take either of two different forms, or both together. The general point I am trying to make is, again, that an emotional belief can be justified only as it enters the rational field and submits to the test of consistency. Now the simplest form that such a belief can take is this: that the world is such as to render the achievement of my ends, or desires, practically feasible. It is clear that such a belief is verifiable in the same sense that a physical hypothesis is verifiable; it is proved by actually achieving these ends. Before the issue it stands justified rationally in terms of our existing knowledge of the character of the world, and of what therefore can probably be done in and with it; when the end has been gained or definitely lost, then, in so far as the belief was simply directed to the possibility of success, it is attested or discredited by the fact.

It is not this practical meaning, however, which has been seriously at issue in philosophy. What one side has claimed and the other disputed is not whether the world is such as to permit the attainment in it of our concrete human ends, but whether it has in its own character certain qualities that involve, not a mere tolerance of our preferences, but the same preferences as our own. This certainly is our naïve point of view under the influence of our feelings. We say naturally, not that the world affords us a chance to indulge our preference for the good, but that the world itself is good, and is working toward a good end. I am not proposing in the least to argue whether this claim is or is not justified; I only say that to go to work to justify it, one must apply the criterion of coherency, and that while the evidence is less convincing, perhaps, it stands logically on the same plane as in the case of any belief professing to describe the *nature of things* as distinct from the *sequences of phenomena*. And even in terms of sequences, complete verification never attaches to universal *laws* of sequence, but only to eventualities in the way of particular anticipated happenings. Just as a belief, then, that the world is intelligible, starts from a natural trust in the powers of intelligence, and is justified by the success with which progressively we bring the world into relation, or just as the belief in the objectivity of scientific law starts from a bias towards orderly expectation, which more and more is rationally justified as events are found to correspond to the expectations aroused—otherwise our belief would not be in a universal law, but only in the particular fact anticipated, and the actual result would verify no more than this

particular expectation—so the belief that the world is good starts from our naïve faith in our emotional preferences, and may equally be considered as verified in so far as the universe turns out to be favorable to the leading of the good life.

And in the same way, though with extreme caution, the possibility is open for a rational holding of beliefs which assert more particular matters of fact, even when verification is humanly impossible. The case that most naturally suggests itself is that of immortality. At the start a belief in immortality is almost on a par with the early glimpsing of ideal human possibilities in this present world—the first dim intuition, say, of a universal human brotherhood. This for a long time had to look so far ahead into the future for its verification that it could be held, like a belief in immortality, only on the ground of an inner assurance of its desirability. But the cases differ in that we should hardly hold as justified a belief about earthly possibilities which history did not show some tendency to realize, whereas immortality at the end is supposedly in the same case as at the beginning, so far as experimental verification goes. But the other possibility remains open, which must always be kept in mind in face of the popular tendency to make scientific verification a necessity, if we are to hold beliefs about events or particular existences. If the belief can be shown to be logically connected with other beliefs for which we do have some ground in the facts of experience, it shares in some degree their rational character. This is the case in science where a fact can be seen to follow from an accepted hypothesis. We do not feel too confident, for we know the uncertainties of our knowledge, until by experiment it has been verified; but it would be a much over-wrought spirit of caution which would refuse it all credence. In proportion to the certainty of the hypothesis and the clearness of the logical connection, do we take many things for granted which we never have put actually to the test. And the belief in immortality makes no claim different in kind, though it may of course differ indefinitely in degree. If we have reason to believe in a particular kind of world, which would be contradicted by the failure within it of certain kinds of life to continue, the belief in immortality is in so far a rational belief, and ought not to be rejected offhand as a mere product of unreasoning human desire. Verification is indeed highly valuable in itself if we can get it, and its absence is a drawback. But it is not essential to rationality. The logical value of verification lies not in the mere experience of the new fact, but in the way in which it enters into the system of reality already present in the hypothesis, and so enlarges and strengthens this. Fundamentally, therefore, it plays the same part as any other fact in this system. But it gets a peculiar significance

simply because it was prophesied and thought out ahead of experience; not only does it counteract our natural tendency to be satisfied with the facts we have already collected, but it is indefinitely improbable that an expectation based upon a complex reasoning process will simply *happen* to hit the future event, as it would do were not the hypothesis already on the right track in its understanding of the world.¹

I may sum up the position I have been arguing as follows: We have to distinguish between the necessity of a belief, its self-evidence, and its practical certainty; and what we are really most concerned about in truth is the last. This is a psychological feeling, a persistent acquiescence or assent which, if it goes along with an honest attempt to canvass the whole situation to the best of our ability, utters the final word about what we shall regard as truth. And instead of attaching to the simplest truths, it belongs rather with the growing fulness of belief and experience. It is due to the compounding of assurance that comes from the working together of numberless facts and satisfactions, and has in it an element both of faith and of intellectual justification, the blending of the two constituting reason. In the large, the faith is faith in ourselves—in the demands of our nature, and the possibility of their satisfaction. This exists prior to the facts, because our life is organic before it is intellectual, and we can not in thinking eliminate ourselves. But we find also these demands capable within limits of getting satisfaction, and so to the naïve trust is added rational conviction. The greater the bulk of experienced fact that comes within our system, and the greater the facility of successful anticipation of future fact, the more our confidence extends; and equally it is greater, the more widely it appeals to the various sides of our nature, in so far as these are approved as normal by the teachings of experience. This is why, other things being equal, a philosophy which finds a place for our emotional needs has a better chance of survival than one which merely orders the facts of sense experience. The former exercises no compulsion whatever over a mind which is not predisposed in favor of humanistic considerations; and if the human mind generally could be counted on to take the same attitude as that of the occasional naturalistic philosopher, the final success of naturalism could probably be predicted. As a matter of fact, it leaves something out which

¹ What I should regard as valid in the pragmatic criterion is, in part, this emphasis on the need of verification *wherever it is possible*, and in part, the claims of practical and emotional satisfaction. But the latter point, as I see it, belongs to a rather different problem—what I have distinguished as the problem of the original source of belief; as *justified* or rational belief, it has relevance only as the considerations involved enter as elements into the intellectual content of our world system.

human nature seems to want; and it is humanism which every time steps in and prevents its triumph.

I may call attention again, in conclusion, to one aspect of the point of view I have been trying to present. Apparently, in opposition to the tendency, from which modern philosophy starts, to search for certainty in belief among the simple results of analysis, it recommends rather the comprehensive beliefs of developed human experience as our standard of assurance in the holding of truths. And to this conclusion I subscribe. Roughly and in the large, I believe it to be so that "common sense," or the more massive convictions of the human race, of man in his natural habitat going about his regular business, supply a standard of sanity which philosophy will reject at its peril. I shall not, however, try to justify this position further, except by noting two points of interpretative caution.

In the first place, I do not, in saying this, intend to disparage analysis. On the contrary, it is only through analysis that beliefs become amenable to reason at all.² We can not be content to accept things simply in the mass, for that leaves no way to choose when the voice of mankind is uncertain in its utterance, or when, as constantly happens, the general belief needs modification and readjustment. I only say that we can not expect to get ahead by throwing over the concrete beliefs of every-day use and confining our assent to their simpler ingredients. The path of knowledge is altogether too crooked and tangled to render this a safe procedure; it is of no avail to have, in reason, a compass, unless we know more or less concretely the goal we are setting out to reach; and there is nothing to supply this if not that somewhat vague and loosely articulated, but very real, *welt-anschauung*, which represents the net outcome of man's experience up to date, which passes over to the individual first as a biological and social inheritance, and which in its large features has already approved itself to him in practise before he is competent to bring criticism to bear upon it, although this or that aspect of it may call insistently for revisal when he is able to interpret his demands on the world more discriminatingly. Just as we commonly think that social reform is best accomplished by taking existing social institutions for granted, and correcting this or that feature as circumstances may dictate, rather than by setting out to abolish everything all at once and building up society from the bottom—the latter task is plainly too big for human powers—so in our philos-

² I may call attention to the fact that my position here is very similar, up to a point, to that of Newman in his "Grammar of Assent"; the disclaimer will rule out, however, certain uses to which Newman puts his theory which are plainly illegitimate.

ophizing the only practicable method is, not to doubt universally, or wherever academic doubt is not absolutely precluded, but to examine our beliefs piecemeal, all the time holding fast as a background to that positive nature of things which appeals to our massive and unanalyzed intelligence through its satisfactoriness on the whole, apart from which we have no way whatever of telling whether any aspect in particular is more or less probable, except in the relatively few and unimportant cases where it is strictly self-evident. To deny this it seems to me would be to overlook two decisive facts. One is that we can not think at all without a background. Thinking is the bringing of our existing beliefs to bear upon the examination of a belief in particular; and the greater the mass of experience interlaced in this apperceptive mass, the more valuable the judgment, though the precise nature of the elements thus present can not in the judgment itself be subjected to analysis. And for sound judgment, this background must have been present at the first step of analysis, unless we are to suppose that the man with positive convictions and a full experience is less qualified to perform the critical act than he whose mind approaches a jelly or a blank. It is not, then, that we clear our minds as nearly as we can of all content when the first analysis is performed, and allow it to fill up again only as the intellectual process advances. What determines the worth of our results is precisely the wealth of unanalyzed experience lying back of the rational process. Naturally, this "assumed universe" ought not to be held exempt from progressive analysis and criticism; we should understand as fully as possible what we are presupposing and why. But the criticism is rather to remove internal inconsistencies than to put on trial the conception as a whole; if we cast aside the garnered fruits of experience, racial and individual, altogether, what remains to take their place? and without some positive background to our judgment, how can we judge? A certain danger does exist in that the very wealth of experience may lead a man to trust his impressions, when a more severe analysis is urgently called for; and it may be inquired, too, whether in view of our knowledge of how unanalyzed judgments go astray, we can avoid a lurking distrust of their pronouncements. But the situation is relieved, in part, by a distinction here. I am not saying that the *judgment* should be unanalyzed. On the contrary, we should use our utmost effort to see our *meaning* in the judgment clearly and distinctly, with the finest discriminations we can manage. No good ever comes of confusion as to what we intend. It is in connection with the grounds for accepting the *truth* of this intention that the vague and more subconscious "total experience" plays its rôle; and while this also should be cleared up as rapidly as may be, my contention is that it

can never be wholly exhausted, and that nevertheless, and even at the start, it is rightly to be trusted under penalty of being left without sail or rudder in a weltering sea of "possibilities" or of "logical entities."

And the second point against the denial is that, as I think, no philosopher ever does hold to the rationalistic method. You will find him all along surreptitiously bringing in the common-sense philosophy of mankind to justify his conclusions—considerations which he would have no manner of right to appeal to if he really were allowing nothing to influence him save his reasoned results up to date; and if he is to do this at all, it surely is much better that he should confess to his procedure and recognize it in his method, not keep it under cover.

What the common-sense world view is, can, in the nature of the case, not be summed up precisely, because it is not itself precise. But it has two main features which will hardly be open to question. There is, first, the scientific side; and this, for modern science, is most comprehensively suggested in the term "evolution" with its implications. There is assumed, that is, a real universe, law-abiding, but also constantly in process of change, and passing to ever new forms of expression. Among these preeminently is man—a creature who does not, however, merely spring from the natural world, but who has the peculiar power of being able to represent to himself this world in knowledge, and then to turn the knowledge to his own ends. With this last point the second obvious feature is closely connected. As man, for science, is a being who through evolution has been endowed with a variety of active impulses, the satisfaction of which constitutes his life, so, for experience, it is found that these needs indefinitely transcend the given or the actual and lead men to the assertion of characters to reality which *ought* to be, though they *are* not. In other words, man is an idealizing animal; he sets up certain ends as worth while, though he does not find them realized in the actual world from which he sprang; and therefore his philosophy has persistently to take account of the discrepancy, and he hits upon various devices for justifying somehow the ideal elements which he finds himself unwilling to give up.

Now even so general a statement as this gives a hint for one further point of interpretation. The first objection likely to be raised against taking the world of common sense as our starting point, is that this world is a very conglomerate affair, and provides no principle of unity such as philosophy demands. In reality, however, a principle of unity is close at hand; and in my judgment it is a more useful one than that to which the philosopher has commonly had resort. Reason, the traditional principle of unity, has ap-

peared to work, I am inclined to think, only because of a readiness to overlook its fundamental ambiguities. If, on the one hand, reason is taken as *objective* reason, or the intelligibility of existence, its unity is pretty much illusory. All it really stands for is the ability to think the facts of the universe together. But of course things already, prior to philosophical interpretation, have been thought together in a sense, otherwise they would not be facts for us. Their "unity" amounts in addition only to a conscious calling attention to the fact that they *can* be thought together; apart from this there is no more unity at the end than there was at the beginning. Concretely, all the discrepancies which called for harmonizing are simply passed over to "reason"; they are not explained because they are called by a new name.

The other interpretation of reason is subjective. But in order to give this any advantage over the previous one, there must be discoverable on the subjective side some form of unity other than the mere compresence of things in a thought content, or in a world. And this, it may perhaps be assumed, is to be found in the concept of a "unity of end"—the fact, namely, that in man reason is used to attain results in terms of a purposeful human life. And rightly interpreted, this is where I think that actually it is to be found; only, from the present point of view, it is misleading to call it subjective. It is not that we start from a subjective human end as our sole assumption, and deduce, if we can, the world from it; rather, man and his ends are objective parts of a total universe which we already have accepted. But they are parts which have the peculiar property of being able to bring into a measure of intelligible harmony our interpretation of the whole. For if we accept as an object of belief the total world of common sense, then the understanding of this world, and all that enters into it, we can explain by showing how it is mediated as a more or less unified life expression of one of the parts of that complete universe which is the object of knowledge, namely, man; although we never could have got the whole world if we had started with a belief in just the human fact and nothing more. For philosophic reflection, our needs are seen to generate our belief; but this reflection already presupposes the whole world in which we believe—human needs included—as *valid*, or it loses touch with reality and becomes a mere academic play with concepts. And in this reflective interpretation, again, what gives the promise of unity to the result is just the experienced *fact* of unity in human life based upon the empirical unity of the organism. To man, as a being who possesses measurably the ability to order and unify his life through the rational power of thinking its elements together and so relating them to a practical unity in the issue and who therefore instinctively tries

to understand the whole world in a way that will lend itself as completely as possible to his aims, is to be traced the only real possibility I see of importing into our philosophic interpretation of reality any greater harmony than that which is implied in the mere existence alongside one another of elements in a thought content.

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DID CONSCIOUSNESS OF SELF PLAY A PART IN THE BEHAVIOR OF THIS MONKEY?¹

THROUGHOUT several months of observation of the spontaneous behavior of six caged monkeys (*Macacus rhesus*), *E*'s method of taking food from the others, more than any other acts observed, showed (1) a motive to perform an act, (2) hesitation and choice of method, (3) distinct efforts to disguise his wish, indicating a consciousness of either his wish or self, and (4) a degree of judgment in selecting the proper moment for his act.

When *D*, a rather slow monkey, and *E* were caged together, and a carrot was given to *D* when both monkeys were very hungry, *D* would usually climb to the platform or jump to the floor to reach the level unoccupied by *E*. *E* would watch *D* nervously eating his carrot and follow to the same level in the cage. *D* would promptly change to the other one. After several such attempts on the part of *E* with failure to approach, he would become more cautious and slowly climb to *D*'s level at a good distance from *D*. *E* would keep his back turned toward *D* and watch his victim by occasionally looking over his shoulder. At the same time he usually scratched about in the sawdust before him as though he were looking for food. This act, seemingly of making *D* believe that he was looking for food, usually fooled *D*, who in his eagerness to eat would quit watching the harmless back of *E*. During this time *E* would be working backwards toward *D* until within reaching distance of *D*'s food. His method of working backwards toward his victim was interesting. He would play both hands about in the sawdust before him, apparently interested in scratching for food, although at the same time he repeatedly partly turned his head and glanced over his shoulder at the other monkey. All of this time he would slowly work backward toward his object. Sometimes he picked up accidentally uncovered pieces of food, but often he was so intent upon *D* that he failed to notice conspicuous bits of food. (The value of this pre-

¹ This study of the behavior of monkeys was made possible by a grant from the Carnegie Institution of Washington to Shepherd Ivory Franz, Scientific Director of the Government Hospital for the Insane.

tended search for food as a disguise for his real intentions is more appreciated when one observes the social adjustment of monkeys. They are very quick to take advantage of the indifference of other monkeys toward their own wishes. Monkeys freely offer themselves as sexual objects to a stronger monkey in order to maintain possession of food, the sexual interest apparently causing the stronger monkey to forget his food interest.)

As soon as *E* drew near enough he would cautiously extend his hand toward the victim by playing it backward in the sawdust, or just reaching backward along his side. If the victim became uneasy he often retracted his hand partly or altogether. When *D* was not watching and *E* had extended his hand far enough so that the distance to reach would not permit sufficient time for *D* to escape or jerk the food aside, *E* would make a quick partial turn of his body and full extension of his arm and grab the food. The partly extended arm made it easier and quicker to cover the remaining distance. Often he would hesitate, extend, retract the arm and apparently judge whether or not *D* was on guard, a condition apparently indicated by *D*'s tendency to move, stop eating, or watch *E*.

E used this method or some modification of it almost entirely in taking food from the other monkeys. His method of scratching for food in the sawdust and of extending his arm backward without turning his body served to disguise his wishes. His behavior showed a wish, hesitation, and choice in the rapidity of approach and maneuvers and in the *disguise of his motive which usually misled his victim*. If he grabbed too soon or too late his victim escaped because *D* and the others were more or less alert while biting and chewing their food, glancing up frequently. The estimated duration of these maneuvers would range from a half minute to several minutes.

B, *C*, and *F* quickly learned to understand *E*'s trick and soon avoided his backward approaches, but the more stupid *D* never did fully understand *E*'s strategy. The other monkeys would simply chase and catch the weaker food carrier. *E* was much quicker and stronger than *D* and could apparently have easily used their methods.

All the other behavioristic phenomena observed in this band of monkeys, although many were complicated and showed motives, hesitation, substitution, etc., could be understood completely without inferring that consciousness of self or better, consciousness and disguise of the motives, existed in the monkey.

Unfortunately *E* had learned his method before he came under observation. He was practically a matured *Macacus rhesus*.

If consciousness of self exists in the more highly developed monkeys, apes, children, and adults, does it add a constant variable which is a factor, an influence in spontaneous behavior that makes

it impossible accurately to determine all the quantitative or even qualitative responses to measurable stimuli of such animals?

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REVIEWS AND ABSTRACTS OF LITERATURE

The Principles of Understanding: An Introduction to Logic from the Standpoint of Personal Idealism. HENRY STURT. Cambridge: University Press. (New York: G. P. Putnam's Sons.) 1915. Pp. xiv + 302.

Of the "Eight Members of the University of Oxford," who in 1902, under the editorship of Mr. Sturt, composed the volume of essays entitled "Personal Idealism," no less than three have now published books on logic, each of which might reasonably claim to be "from the standpoint of personal idealism." It is true that Professor Boyce Gibson writes professedly from the viewpoint of Eucken; but he would be the first to deny that there was anything in his "Problem of Logic" which was not in thorough harmony with the principles of personal idealism.¹ Dr. F. C. S. Schiller, in his "Formal Logic," makes a far more extensive use of the principle of personality,² but his exposition is considerably restricted and hampered by what he is criticizing, and in the end he only claims "to have cleared the ground for a new Logic that will not disdain to reflect upon real thinking. . . ."³ The way is thus left open for Mr. Sturt to produce a work dealing with "the actual processes of human understanding,"⁴ and "The Principles of Understanding" claims to be an introduction, a discussion of questions preliminary to just this task.⁵ It is not a "System of Logic," such as Professor Boyce Gibson is attempting to write, and as Mr. Sturt disagrees sharply with his definition of logic,⁶ and does not mention Dr. Schiller at all except implicitly,⁷ we seem justified in inferring from the sub-title that the present work is intended by its author to be the "official" introduction to logic from the standpoint of personal idealism.

What then is the "Standpoint of Personal Idealism"? It consists

¹ See his justification for excluding personality from his limited problem ("Problem of Logic," pages 3-5), and the intention to cooperate "between the idealism of the Hegelian school . . . and the psychologism of the pragmatic and genetic movements . . . so far as is relevant to the requirements of a logical treatise" (*op. cit.*, page ix). He also makes much use of the principle of spirituality.

² Cf. "Formal Logic," pages 11, 149-150, 314, ff., etc.

³ *Ibid.*, page 409.

⁴ "Principles of Understanding," page vii.

⁵ *Ibid.*, page viii.

⁶ *Ibid.*, pages 4-8.

⁷ Cf. especially the rejection of the "Utility-theory of Truth," pages 287-288, which is perhaps directed against Dr. Schiller.

mainly in holding (1) "that personal experience should be the basis of our (philosophical) synthesis," and (2) "that personal experience is spiritual" (p. vii). As applied to logic, the first of these principles involves basing one's logical theory upon "personal experience." In Mr. Sturt's hands this is interpreted in a quasi-psychological sense. He distinguishes himself sharply from those logicians who seek to study the universality and necessity which they find in reasoning. He attacks "the apriorist" and (1) challenges him to produce any *a priori* laws which constitute the "governing principles" of "actual thinking," and (2) tries to show that "there can be no such laws of thought as the *a priori* logician desiderates." "The whole notion of *a priori* laws of thought" is declared to be "an anachronism, the ghost of the old formal logic haunting our schools long after its real life is ended" (p. 3). This serious misunderstanding of the aims of most logicians seems to be due to his point of view. His own question is: how do we think? and for him "the purpose of logic is to explain the processes of our own minds and the minds of persons whom we know" (p. 2). For this purpose "a logic based on psychological observation" (p. 119) is needed, and the only "laws of actual thinking" discoverable by this means are, of course, inductive generalizations, very different from the "laws" studied by other logicians. It is true that it would be illegitimate for Mr. Sturt's purpose to take *a priori* laws in place of such generalizations; but for logicians whose purpose is not to discover by a psychological method "laws of actual thinking," but rather to investigate the forms of *validity* in thinking, it is Mr. Sturt's inductive generalizations that would be out of place, and *only* universal and necessary principles that can be admitted. If Mr. Sturt is serious in challenging the existence of such principles in logic, he might read Carl Müller-Braunschweig: "Die Methode einer reinen Ethik," or perhaps Mr. Bertrand Russell's "Problems of Philosophy," for a discussion of the whole position and for a few examples.

As might be expected from this attack on "the apriorist," as well as from *Idola Theatri*, Mr. Sturt's opposition to "intellectualism" leads him everywhere to magnify the practical and concrete, and to treat the theoretical as "an extension of the practical" (p. 257).⁸ It is perhaps for this reason that we find no reference to the original⁹ investigations of the thought-processes, and are given instead a sort of résumé of general psychology from the point of view of the light it throws on the processes of "actual thinking." It is only fair to add that, with the possible exception of Professor R. M. Ogden, most psychologists would regard the work less as a "logic based on psychological observation" than as a psychology based on certain logical assumptions.¹⁰

⁸ For this emphasis on the practical, cf. also pages 4, 39, 127, 141, 253, *et al.*

⁹ Cf., e. g., page 107, where Titchener's "Lectures on the Experimental Psychology of the Thought-processes" receives scant consideration.

¹⁰ The introduction, by Professor Ogden, of the "directive tendencies" as the governing principle into so much of psychology ("An Introduction to General Psychology," 1914, esp. pages 147-150, 155-160, Ch. XV., *et al.*) has produced a work which in many ways is analogous to Mr. Sturt's book, though written professedly on psychology.

The chief business of understanding is "to get what we want in order to live," "to form plans and purposes for satisfying our daily needs" (pp. 4, 12). Invention, "the prospective use of understanding (p. 7), is thus the most important function of understanding, truth-seeking being entirely subordinate" (p. 4). It follows that the typical judgment for logical theory is not a recognition-judgment like "all men are mortal," but rather something like "the Liberals will win the next election." Invention of plans, moreover, being a kind of doing (p. 13) presupposes a "dynamic theory of consciousness," and Mr. Sturt feels called upon to argue in favor of interactionism (pp. 26-28) and a "soul" (pp. 28-31)¹¹ as against (1) the late Mr. Shadworth Hodgson's view of epiphenomenalism, and (2) the view of psycho-physical parallelism expounded by Professor G. F. Stout in the "Manual of Psychology" (pp. 13-26). He further feels himself impelled to write chapters on Sensuous Experience (Ch. IV.), on Subconsciousness (Ch. V.), and on Passion (Ch. VII.). There is also some account of the development of personality,¹² of the gradual severance of understanding and passion from a more primitive state,¹³ and some treatment of their mutual implications (pp. 235-fn.).

After all this, we may reasonably ask: well, how *do* we understand? Or, if practical (p. 141) invention is the main use of understanding, how do we invent? The answer to this question is typical of Mr. Sturt's method. In a general way we are told that in simple construction or invention (pp. 32-36) we can distinguish (a) the material arranged (chiefly (p. 93) sensuous experience) and (b) the arranging. The latter, arranging in patterns or systems, is "the active and formal element in intelligence," and is known as "Noesis." Its function is (1) to form sensuous experience into coherent groups that can be retained and recalled, and (2) to apprehend patterns or forms in sensuous experience (Ch. III.); both functions are "conventionally" united under the common term "Cognition of Form" (p. 35).¹⁴ We thus see that invention means constructing patterns in sensuous experience, but are not yet informed what "constructing" means and what we are to understand by "patterns." Later we learn that while "no one can explain invention in such a way that we can see the methods of the inventor fully revealed . . . we must avoid the fallacy of supposing that we can know nothing about it. . . . It is the duty of the logician to explore the method," even though "it may be a characteristic of the method that it can not be articulately expressed, and therefore can not be taught by articulate instruction (p. 138)." The method is "explored" as follows (p. 142): we have (1) urgent desire, (2) long anxious brooding, (3) encounter with some suggestive accident, (4) *sudden invention of some suitable plan*, (5) joy of the agent in the successful outcome of his mental striving. It is obvious that the kernel lies

¹¹ The polemic against psycho-physical parallelism is the one piece of really close reasoning in the book.

¹² Especially in Ch. VIII.

¹³ Ch. IX., especially pages 234-235.

¹⁴ Mr. Sturt might have learned from Mr. Prichard ("Kant's Theory of Knowledge") that apprehension and construction are two very different things.

in (4) (which I have italicized). Yet in what follows, only (1) and (2) are dealt with in detail. From the subsequent discussion we gather that the "invention of some suitable plan" is connected with "originating schemes," but this too turns out to be a will-o'-the-wisp.¹⁵ "The faculty of originating schemes . . . is . . . the primary datum of logical theory . . . for the logician it is ultimate. . . I do not offer to explain it; with our present knowledge it is not explainable, and perhaps it never will be (p. 148). Is an investigation of this kind expected to "involve a thorough reconstruction of logic" (p. 7)?

The second principle of personal idealism is that personal experience is "spiritual." The whole value of such a principle turns on the sense in which the term is used. In Mr. Sturt's¹⁶ hands its actual meaning seems to be mainly negative. Thus in the argument that Noesis is spiritual because it is "total-working," and functions in a way which we can not reckon among the properties of "matter," the meaning appears to be equivalent to (1) non-sensuous, and (2) non-mechanical.¹⁷ It is also employed in the "dynamic theory of consciousness," which runs throughout the book. But, apart from the vague satisfaction which the use of words like "spiritual" and "soul" appears to give to Mr. Sturt,¹⁸ it is not easy to discover what *scientific* value is derived from his use of the principle. He does indeed use it in dissenting from Bergson, Stout, McDougall, and Mr. H. W. B. Joseph in the matter of the "mechanical element in Association." Here he "sees no reason to believe in more than one principle of mental retention" (p. 64), which principle turns out, as one would expect, to be the "spiritual" noesis. For the usual association by contiguity and by similarity, he proposes as noetic alternatives: (1) Systematic Association, and (2) Intersystematic Association, respectively.¹⁹ To this suggestion there are two serious objections. In the first place there is no strict correspondence; in fact, of the two, "intersystematic association" resembles the usual association by contiguity rather than association by similarity. In intersystematic association we have "association between a component of one system and the totality of another system," and this is explained as follows (p. 76): "some of the components of the first system may have formed part of some other system $\Sigma_2(D, F, G, H, J)$. If then the agent be not following out keenly the plan Σ_1 , the component *D* may switch his mind off to another line of interest in virtue of the association with Σ_2 ." Mr. Sturt's treatment of this

¹⁵ Cf. pages 239-242, from which we learn that a scheme (the "essential formula," p. 58) is "the subjective correlate of situations and objects," that it arises in the subconsciousness as a definite principle of grouping sensuous elements so as to form some phenomenon, and that (cf. p. 56) till thus "articulated in sensuous material," the scheme is inarticulate. This, however, tells us no more than we knew already in Chapter III.

¹⁶ Mr. Sturt might here have learned something from the use of this principle by Professor Boyce Gibson, in the "Problem of Logic."

¹⁷ Especially pages 41 and 52.

¹⁸ Cf. *e. g.*, Ch. I. of "Idola Theatri."

¹⁹ Pages 39, 40, 42, 50-51, 65, especially 75-77.

phenomenon as "almost pathological"²⁰ will only confirm the critical reader in his suspicion that "the component *D*" functions in a mechanical way after all, and that this is concealed from Mr. Sturt mainly because of his assumption that every "modification of the soul" is non-mechanical.²¹ In any case this does not correspond to the usual "association by similarity," while there is clearly no connection at all between "Systematic Association," which is "grouping coherently,"²² and the current "association by contiguity"; so that the claim to "explain *respectively* what the old psychology called association by contiguity and association by similarity"²³ is illegitimate. In the second place, while it is of course a fact that we form systems and also manage to organize those systems to some extent, this is so far from being an "alternative" to the "old view" of association, that the two can very well continue to subsist side by side; both systematic and intersystematic association might in "the old psychology" take place either by similarity or by contiguity, and as they are plainly not *in pari materia*, Mr. Sturt is evidently mistaken, apart from the fact that he has here a consensus of psychological opinion against him.

In details, there is considerable appearance of information and of being "up-to-date." A very large number of contemporary authors will find themselves referred to, chiefly by way of open dissent. But a more minute examination exposes the real superficiality of much of this apparent erudition. There is no doubt that neither Professor Stout nor Mr. McDougall will feel obliged to defend themselves against what is often palpably mere misunderstanding, and in some cases of subject-matter the text implies unfamiliarity with the view criticized, at least a lack of first-hand acquaintance with the scientist responsible for the doctrine. For example, a well-known theory is referred to as "the curious process . . . known to psychologists as 'repression'" (p. 74), and a case of psychoanalysis (correctly described) is introduced by the words: "The case, which was related to me by an eminent English physician from his own practise. . . ."²⁴ To speak of psychoanalysis in this way, without mentioning Freud, is remarkable, though not perhaps so remarkable as so definitely an "Oxford man" as Mr. Sturt²⁵ writing a book on logic without the slightest reference, explicit or implicit,²⁶ to the late Professor Cook Wilson and to the views of logic which have been taught

²⁰ Page 77. It is said to "show a failure of power," i. e., of "noetic power," for which *cf.* page 69-70.

²¹ *Cf.* especially pages 88-89.

²² Ch. III., *passim*, especially pages 39 and 75.

²³ *Italics mine*: see page 75.

²⁴ Pages 131, 132. I do not doubt that Mr. Sturt has heard of Freud; but no one with first-hand knowledge would imply that psychoanalysis was connected chiefly with "an eminent English physician."

²⁵ *Cf. e. g.*, the title-page: "*private tutor in the University of Oxford*" (*italics mine*), and the opening of Ch. I., and also "*Idola Theatri*," *passim*.

²⁶ Unless we are to take the reference to Mr. Joseph (p. 9) as an implicit reflection on Professor Cook Wilson.

officially at Oxford under his direction. One more instance: Memory is discussed without reference to Ebbinghaus, although Mr. Sturt even goes into the detail of "nonsense-syllables" (pp. 62-63, 65-68). The instance given in the text is, however, sufficient to convict him not only of unfamiliarity with original monographs, but also with the standard procedure in experimental laboratories. Heuf, Powz, Jeel, Shob, Toov, Wawch, and Quyg are inadmissible, and only five of the twelve syllables given can be said to come under the rules. However, Mr. Sturt might rejoin that exactitude in details is pedantic, and that to the point of his argument it is immaterial that his nonsense-syllables vary from three to five letters, and from one to two vowels. Such an answer would be thoroughly in harmony with his perhaps deliberately "amateurish"²⁷ style, but would not tend to induce belief in his scientific trustworthiness.

To the occasional looseness of expression corresponds a real looseness of thought. A logician who claims that any logic not "based on psychological observation" is "immeasurably smaller than the thing it professes to explain" (p. 119), should at least not be dependent on "the old official logic" at every point. Most logicians at least attempt to analyze such terms as "meaning," "logicality," "rationality," "coherence," "consistency," "system," etc., without reference to psychology, and it is precisely this method that Mr. Sturt wishes to condemn. But he allows his interest in the practical and concrete to blind him to the fact that all along he is presupposing, and indeed using, just these concepts, and using them in an uncritical way which precisely contradicts his main intention. Consider, *e. g.*, the discussion of "logical quality"²⁸ (pp. 5-8), which is made to consist in "forming *rational* purposes and working *rationally* to achieve them," in having "*meaning and consistency*," "*fulness of meaning and consistency*," etc. One question "has less *meaning*, and therefore less *logicality*" than another; statements which show "*no meaning in their context*" are illogical.²⁹ Mr. Sturt would himself no doubt justify this procedure by stating that he intended these terms in the "practical" sense, of which the theoretical is only an extension (p. 258). But to most readers it will be only too plain that the practical sense of, *e. g.*, "consistency"³⁰ presupposes throughout the theoretical sense of the term, and that, too, in the sense in which it is analyzed by the logicians whom he

²⁷ *Cf.*, *e. g.*, page 107: "the existence of imageless thought has been established by elaborate investigations in *Germany and elsewhere*" (italics mine), and page 102: "T. H. Green, as *Professor Hobhouse somewhere remarks*, gives no clear leading as to the rôle of sensation . . ." (italics mine). The same general style is found in "*Idola Theatri*," *passim*. The only exception to it seems to be the polemic against psycho-physical parallelism already referred to.

²⁸ Italics mine.

²⁹ *Cf.* the account of language in Ch. VI. (especially pages 170-171): language is a *logical system* . . . due to the "*social mind*," which makes national speech fit with the national aims. *Cf.* also page 256: "each man's world has *unity as an intellectual system*." *Cf.* also page 280: "The possibility of science depends on belief in the *systematic character of nature*." (Italics mine throughout.)

³⁰ *Cf.* pages 266, 269, 273.

wishes to supersede.³¹ In fact, the main difficulty with the whole book, which is far from uninteresting and uninformed, is a weakness in self-criticism, especially in the interpretation of principles. A logic which deals explicitly with "processes" (p. 2) from a "psychological basis" (p. 119) has no right to criticize the logicians who study precisely these questions of consistency, universality, and validity, as if they had nothing to do with personal and "spiritual" experience. They are dealing with what is objective in personal experience, and the concepts which they study are essential to all objective science. If Mr. Sturt is right in his interpretation of the principles stated in the preface (p. vii), and in opposing them to the investigations of other logicians, then personal idealism is within measureable distance of becoming looked upon as a minor variant of "subjective" idealism.

Mr. Sturt himself would like his work to be judged with reference to two points (p. viii). The first question he proposes is: Does it throw any light upon the way in which our minds actually work? The second question is: Does it contain suggestions useful for those who think much and are training others to think? To both questions the answer is: Yes. It *does* throw some light, it *is* suggestive; in neither case quite as much as Mr. Sturt thinks (for is not Noesis ultimately inexplicable?), but still, many of his contentions are true, and yet more are suggestive and "useful." But for the reviewer there is a further question, viz., how much of what is valuable can Mr. Sturt consider as his own original contribution? The polemic against the "part-working theory of association" (pp. 43-50) is at least thirty years too late, and for most of what is "useful" in the book the credit is due elsewhere, notably to Professor G. F. Stout.³² What is original is chiefly the point of view from which Mr. Sturt has made a number of comparisons in reviewing work done by others, and the credit for the work done remains with those who have done it, while the point of view has been already sufficiently criticized.

The book is well printed,³³ but the index is a mere *Index Nominum*.

RUPERT CLENDON LODGE.

UNIVERSITY OF MINNESOTA.

³¹ Mr. Sturt vacillates on the question of "formal" logicians. Contrast, e.g., pages 1 ("logic in the narrower sense") and 115-116 with such passages as those referred to above and page 3: "rules of the Syllogism, for which nobody now has a good word to say."

³² Mr. Sturt recognizes this, perhaps (pp. 119-120), but only implicitly, if at all. It is true that very much of the present work is either repetition or development of similar views in "*Idola Theatri*," but there, too, the chief credit is due to substantially the same writers.

³³ I have noticed only two errata, viz.: in the middle of page 138, "make" should be "made," and on page 136 "technology" should be "terminology," unless perhaps Mr. Sturt is using it deliberately as a syncopated form of "technical terminology."

Societal Evolution. A Study of the Evolutionary Basis of the Science of Society. ALBERT GALLOWAY KELLER. New York: the Macmillan Company. 1915. Pp. xi + 338.

A relationship, more or less close, between evolution and sociology has long been freely assumed, not only by popular writers on social topics, but also by authoritative writers in the field of sociology, and as in other cases where an assumption is substituted for careful analysis, vagueness and misconceptions, amounting in some cases to error, have resulted. The science of society has now for years been under the handicap of the kind of evolutionary sociology taught by Herbert Spencer. His application of the theory of evolution to the life of human societies has gone successfully unchallenged far too long. There have been attempts by natural scientists—Darwin and others—to extend evolution into the social field, but they have been notably disappointing in their results.

In this book Professor Keller gives us a searching analysis of the relationship between Darwinian evolution and the science of society. He takes the terms variation, heredity (transmission), selection, adaptation and shows, by clear exposition and apt illustration, what they mean when applied to human societies and how useful these terms may be in sociology and the other social sciences if their exact application be clearly understood.

He makes use of and extends somewhat the conception of the folkways, as developed by his predecessor at Yale, Professor Sumner, and points out that societal (social) adaptation is cerebral and psychical, through brain activity rather than through organic and structural modifications, although the connection with organic evolution is unbroken. He insists that "societal evolution is the evolution of society and its institutions, not of a series of individuals." His clear insight and cogent reasoning are well illustrated in his treatment of the topics of rational selection and counter-selection. At no point does he dodge the issue and he reaches a conclusion. Others than sociologists will find this book of interest.

J. E. CUTLER.

WESTERN RESERVE UNIVERSITY.

JOURNALS AND NEW BOOKS

REVUE DE METAPHYSIQUE ET DE MORALE. January, 1916.
Le déterminisme historique et l'idéalisme social dans "L'esprit des Lois": G. LANSON. — Since Montesquieu, about 1748, adhered simultaneously to all the affirmations of his manuscript, there can be no absolute incompatibilities or insoluble contradictions in it. This article attempts the reconciliation of the apparent divergencies of the topics indicated by its title. *La science et les systèmes philosophiques:* E. MEYERSON. — Positivism must be supplemented by metaphysics because of certain fundamental contradictions in the attempts of science to give an account of the world. *Art et Métaphysique:* E. GILSON. — "If we represent science as working on the

surface of the real, and metaphysics as an effort to install ourselves at the heart of reality and to obtain the direct and immediate feeling of it," we must place art outside of both as a force which works to introduce richer and higher forms of psychic life into the universe. *Notes de critique scientifique. Le temps et la mécanique héréditaire*: M. WINTER. *Questions pratiques. La force et le droit*: D. PARODI.

Baldwin, J. Mark. The Super-State and the "Eternal Values." The Herbert Spencer Lecture delivered before the University of Oxford. Oxford: Oxford University Press. 1916. Pp. 38. 1 s. 6 d.

Cunningham, G. W. A Study in the Philosophy of Bergson. New York: Longmans, Green, and Company. 1916. Pp. xii + 212. \$1.25.

Gates, Arthur I. Correlations and Sex Differences in Memory and Substitution. University of California Publications in Psychology. Vol. I., No. 6. Pp. 245-250. 1916.

Heller, Walter S., and Brown, Warner. Memory and Association in the Case of Street-Car Advertising Cards. University of California Publications in Psychology, Vol. 2, No. 4. Pp. 267-275. 1916.

NOTES AND NEWS

"THE Walker trustees of the University of St. Andrews have hit on a vital idea in inviting essays on Prayer. The writers are to consider 'the meaning, the reality, and the power of prayer; the place and value to the individual, to the Church, and to the State; in the every-day affairs of life; in the healing of sickness and disease; in times of distress and of national danger; and in relation to national ideals and to world progress.' This programme is wide, and some of the essayists may, perhaps, discover tributes from the unorthodox. George Meredith, who would have no word of dogma in religion, practised daily prayer to his life's end. There are prizes for St. Andrews students and alumni, £20 and £50, respectively, and one of £100 open to the world, and writers in any language; and the contest will be one of sheer merit, as the contributors are to use mottoes. The trustees may, at their discretion, allot additional prizes. All essays must reach the Secretary, The University, St. Andrews, on or before June 1, 1917."—*The Athenæum*.

AT Columbia University Summer Session Professor Harry Allen Overstreet, of the College of the City of New York, and Professor M. T. McClure, of the Tulane University, are giving courses in philosophy.

MESSRS. HENRY HOLT AND COMPANY announce for publication next month "Creative Intelligence" by John Dewey, professor of philosophy in Columbia University.

THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY

AND

SCIENTIFIC METHODS

VOL. XIII. No. 16: AUGUST 3, 1916

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

PHILOSOPHY AND THE WORLD'S PEACE

I

THE first prerequisite of a test of progress is to know in what progress consists.

In general, to progress would appear to be to come closer to one's goal in life. Decades ago the economic school of Bentham and Mill proclaimed anew the ancient principle that the true goal of social activity is the "greatest happiness of the greatest number" of human individuals. More students of theory, and more followers of practise, have agreed on this formula than on any other of its kind; yet the year of our Lord 1916 sees the people of eleven of the world's principal nations devoting unparalleled energies to a task the outcome of which is a reduction of their mutual happiness more rapidly and permanently than would be possible by any other method.

However, the difference between war and peace is not so great as it seems to the man who, in a prosperous mood, reads the story of the merciless torpedoing of a great ship, or the machine-controlled slaughter of troops on the field of battle. The fruits of years of thoughtful toil, of loving care, are destroyed in one horrible moment, but still, men would not so readily accept chances of death in the trenches if all of the places of peace were filled with sunshine and glory. The peace of nations is not the peace of individuals, and peace between individuals is not that peace of mind which "passeth understanding."

He who covets the millennium must be patient. Biology teaches us that human life is an experiment, one of nature's researches. Nothing is so slow as the progress of the researcher, and no worker is more clumsy, if at the same time more persistent, than nature. The *élan vital* has tried many paths of advance which proved to be *culs-de-sac*, and for which the existing evidences consist only of bones and traces in the rocks. It is a matter of some billions of years since the first microscopic specks of life appeared in the warm, and omnipresent, seas. It is a matter of millions since life first crept to land. It is a matter of only a few thousand years since it first tried the experiment of being human, of getting along principally by

means of brains. What if this latest, and so recently started, experiment of nature's should fail? What if brains should prove inadequate, and we creatures of nerves and weak tissues should be mastered, and reduced to geological traces, by the unintelligent forces which we attempt to control?

We perceive that the lives of individuals are often utter wrecks; we see that whole nations, and groups of nations, collapse and decay; we witness the extinction of anthropologically distinct classes of humanity. But that the total species of mankind, human life in its entirety, with its versatility, its outlook upon nature, and its projects for the future, should be wiped out, it is almost impossible for us to conceive. Yet this conviction of the stability of the species may be merely an obsessing idea, due principally to our inability to think in terms of large units of time.

Astronomers say that, even if we assume our knowledge of the laws of gravitation and of motion to be adequate, the continued existence of the earth as a place of habitation can be absolutely guaranteed for a period of only a few years in advance. At any moment a plunging "dark star" may appear in the outskirts of the solar system, and before it has finished, may completely wreck what we regard as the perennially established order of things. Or, again, suppose that some sudden mutation should produce a bacterial poison against which the immunizing powers of the human body could not prevail. For a *Foraminiferan* or a *Teleost* fish to maintain that his kind would always be represented on the earth would not partake so much of audacious boastfulness, for the life of their species is measured in millions of years, not in a few thousand.

More threatening in its outcome for the race than the appearance of a new and deadly contagious disease is the danger from a possible emotional instability in the constitution of man himself. The unique attribute of the human nervous system, the characteristic which has caused the race to make such a flare in the world, is just its instability of reaction, its capacity for being moved by weak and small and distant stimuli. The automatism of instinct has been replaced by intelligence. It is his ability to adapt himself to details, to have his whole system of behavior modified by experience, and even by the symbolic representations of experience in the form of language, which has made it possible for man to master the rest of nature as he has. But can he master himself? His sensitive nerve structures are made over from lower animal forms, and intelligence is still only a tenuous infiltration among instinctive tendencies which, given an adequate stimulus, may be aroused to a power which no intelligence can resist, and to which it must become humbly subservient or perish.

In biology, success means the ability to exist, and progress stands for the development of more and longer existence. The dominant instinctive mechanisms of all organic species are those of self and race preservation. Thus it is the same, primitively, with man. Hunger, lust, fear, anger, and their derivatives, can arise within him, paralyze and usurp the functions of his intelligence, and leave him, in the end, perhaps physically, perhaps mentally, perhaps socially ruined. If this can happen to an individual, it can happen even more readily and completely to a group of individuals, such as form a nation. The "psychology of the crowd" is that of the brute and of the child.

The most prominent individual participants in the present welter in Europe admit that no intelligent justification for the war can be found. The attempts at intelligent justification which have been offered are, in nearly every case, transparent excuses. It was fear which sent the Austrian ultimatum to Serbia; it was anger which mobilized the Russian army; it was hunger which welded Germany to Austria, and which turned Italy against her; it was fear and anger which accomplished the "rape of Belgium."

Although we have still to arrive at an exact definition of progress, biology alone is sufficient justification for the statement that the killing and maiming of millions of men, and the wholesale destruction of the instruments of human living, are not progress. Death, as it is involved in the elimination of the unfit, is perhaps one factor in evolution; but it is now a truism that war systematically destroys the fit and permits the unfit to survive.

The destructive power of instincts whose biological purpose is to preserve the individual and the species, obviously springs from the fact that the preservation of one species often demands the annihilation of another. However, conditions may develop under which every outbreak of these destructive instincts injures both participants in the conflict. This is obviously the case when the conflicting units are mutually dependent parts of a more or less organic whole, such as human society, or when they are very accurately matched. The present struggle in Europe appears to involve both of these situations. The disintegration of commerce and science, which has occurred on account of the war, has left all of the nations involved worse off than they were before, and, besides this, the fighting groups are so evenly matched that in spite of tremendous losses, no decisive battles are fought. We can imagine this process of social decomposition, and the dribbling away of life, going on until it has broken society up into feudal units, each of which is poverty-stricken, but remains able to manufacture enough supplies of war to continue

taking toll of the lives of its enemies.¹ The end of such a process as this might well be the end of humanity, for it is through co-operation and social organization alone that man can hope permanently to dominate the earth.

What would be the cause and excuse of such a disaster as this? Certainly, nothing on the side of intelligence, but only the collapse of intelligence under a storm of instinctive emotions, which, once started, would gather mass and momentum like the snowball which rolls down a hillside. None of us believes that any such calamity as this is going to befall humanity, but it is highly desirable that we find some reason, other than general optimism, for rejecting the possibility. Two years ago none of us would have believed that within a year ten of the foremost nations of the world would be engaged in the most beastly war of history.

II

The lapse of human action into the crudely instinctive type when, as is generally the case in society, intelligent behavior is demanded instead, has long been condemned by an institution whose sole function in society lies in the issuance of these condemnations, namely, the *church*. Religion classifies such lapses under the category of "Sin," and it seeks to correct them by the promulgation of a doctrine of metaphysics. The *state* limits their occurrence in the individual by creating situations in which the instincts are turned against each other. It sets fear against anger and lust; it sets hunger against sleepiness; and it titillates the ego in return for self-control and self-sacrifice. But there is no world state and no world religion to chasten the behavior of nations. Each has a God of its own, who hates other nations, insures the welfare of his own people, and condones whatever may, to their enemies, seem misdeeds.

During nearly two thousand years multitudes of intelligent people have looked hopefully to the teachings of Jesus Christ and his Apostles to furnish the world with a universal religion. In the story of his guileless life and miraculous deeds they seemed to catch a glimpse of a supernal attractiveness which must eventually draw all men to him. The Christ story is that of a man utterly controlled by an exalted purpose, exalted in the sense that it spurned every crude instinctive tendency. No sincere man, who loves his fellows and is enthusiastic for human life, can fail to respect this rare character, when it is beheld, not as an idol, but as a concrete human career.

Moreover, it can not be denied that Christian and Hebrew teach-

¹ Such a state of affairs, resulting from a world struggle like the present one, is graphically depicted in Mr. H. G. Wells's "The War in the Air."

ings have made a valuable contribution to human thought and progress. That this contribution has been to any important degree decisive or determinative may easily be doubted, but more easily since the outbreak of Europe's "international lunacy"² than before. Lately, we often hear the question: Is Christianity a failure? In answer, we can only say that we do not know, but it is certain that its practical success has been disappointingly small, considering its nearly two thousand years of activity. The world was not much more of a moral chaos when Christianity appeared than it is now. What we have achieved of system has been largely physical.

The principal difference between 500 B.C. and A.D. 1916 lies in the consequences of an unimpeded study of nature. It is the ideas latent in the thought of Copernicus, Leibnitz, Gutenberg, Watt, and Faraday which have changed the world, scattered and amalgamated races, liberated man from his slavery to the soil, and built up the tremendous and now sadly threatened structure called "business."

Christianity can not even claim the credit of having given man's mind the intellectual freedom required for the prosecution of scientific studies. The stimulus to modern science comes from the open-minded Greeks, whose culture was suppressed by the church, when Rome became Christian, and remained in the hands of Mohammedans until the Renaissance. Moreover, the church has fought to the finish every development of science, such as the Copernican theory or the doctrine of evolution, which has appeared to have moral corollaries.

Greek culture possessed the germs of physical and moral stability. These germs never came to fruition, and Greek culture disappeared in an internecine outburst of primitive passions, because there was nothing to compel the Hellenes to believe in the truths which their philosophers enunciated. Is this failure to be reduplicated in the case of the Christianized world which has as yet a history not so long as that of the Hellenic? Christianity is more compelling than Platonism, it must be admitted, and yet its power over human behavior seems to be inversely proportional to the degree of sophistication of the individual concerned; its strongest influence is with the simple-minded, the untutored "heathen," and the born mystic. The percentage of advanced students of science who accept the Christian system is vanishingly small; the number of business and professional men who adopt it, not merely as a verbal creed, but as a vital guide of behavior, is also inconsiderable.

We record these facts only in a mood of disappointment. Christianity has promised to save the world, and it contains within it prin-

² Mr. Peter Witt, of Cleveland, must be given the credit belonging to the invention of this highly descriptive phrase.

ciples which, if applied, would accomplish a great deal towards that end. Moreover, the promise was sincerely made. If the Christian system is losing its grip on individual minds, if, as appears to be the case, it has entirely lost its hold on the nations of Europe, what is to be the final result? This is a practical question. History and anthropology show that some sort of religion is an invariable accompaniment of social life. This means that religion has a necessary function, and that without it society will die. In an uninspired society, technical science becomes the slave of group instincts and, in the end, may be chiefly occupied, as it is in the countries of Europe to-day, in the production of the most effective instruments of death and mutilation.

We have taken Christianity as our text because it is the religion of our people and of the most enlightened and successful people. The non-Christian religions still claim sixty-five per cent. of the world's inhabitants. They probably grip their followers more firmly than does Christianity, but their claim to success as instruments of progress must be accounted almost negligible.

III

Here, again, we find ourselves faced by the question of the meaning of the word "progress," which we seem forced to employ in our evaluation of human events. Progress is something which we believe in and experience before we know what it is, and the problem as to its nature is one of fact rather than of mere verbal definition.

When we come to analyze the facts which we call progress, we are tempted to lay great emphasis upon the achievement of individual happiness; but the matter goes deeper than this. Progress for the individual consists in the attainment of the things which he desires, of the things he strives for. This process is slow and statistical, that is, one progresses or retrogresses "on the average." If I waylay my neighbor and get his bank-roll I progress for the time and with respect to one motive, but after I have been caught and imprisoned for a term of years the whole affair appears to be retrogressive, even from my point of view alone. On the whole, my desires have been thwarted.

The factors entering into my progress thus include those which are involved in the progress of other human beings in the community in which I live. There are factors beyond the social and the human, moreover, such as the climate, the astronomic relation of the earth to the sun, the laws of gravitation and of centrifugal force, and so on. But, more important still, is my own constitution, my system of interests and capacities, my native endowment and my education. This, in turn, depends upon, and in fact is merely a

stage in, the progress made by my forefathers, by my country, my race, my species, by the order of primates, the class of mammals, the family of vertebrates, and by life on the earth. But since science teaches that the non-living and the living are continuous with each other, I must say that my progress is one link in a long chain which takes us back not only to bare primitive protoplasm, but to the chemical development of the world of substance, and to the synthesis of the elements themselves.

In other words, to define progress in its fullest sense, we must say that it consists in a certain movement or directioning of events in the universe, which is exemplified, in one of its stages or phases, by what we call the attainment of happiness. It is a cosmic change closely connected with the processes of evolution and development in the biological sphere. Our own advance, so far as we make any, is part and parcel of this world movement, and must ultimately be measured by it rather than furnish the measure for it.

This sounds more like the statement of a religious faith, than a definition. There is an excellent reason for the impression, but it need not weaken the logical force of the assertions. We can limit the word "progress" if we like, but if we take it in its broadest possible sense it is certainly not a matter of single individuals, single species, single times, or single forms of matter. It is a tendency in things, a set of causes moving slowly in a direction which we call forward. Thus defined, the conception furnishes us with a stimulating problem and one which, I believe, constitutes the fundamental problem of *philosophy*.

Philosophy and religion have always been intimately related; the reason for this lies in the fact that the former is often a refined and critical edition of the latter. Philosophy and science are also closely affiliated, in such a way that philosophy often appears to be a generalized and speculative form of science. However, philosophy has not seldom found itself at odds with religion and also with science, because it has attempted to correct both.

In the time of the Greeks philosophy stood for the sum-total of supposedly critical and accurate knowledge, together with the methods of obtaining such knowledge. At this period the methods were almost wholly *speculative* in character. As the effort to obtain exact knowledge has advanced, free speculation has been at least partially replaced by more reliable methods, and wherever this has occurred the department of knowledge concerned has been divorced from philosophy proper and set up as an independent *science*.³ The

³ This historic course of events is discussed, with characteristic suggestfulness, by William James in his posthumous volume, "Some Problems of Philosophy," Ch. I.

result is that, at any time, the residuum, to which the method of free speculation alone appears to be applicable, is all that remains to philosophy. It is natural, therefore, that philosophy should fall into disrepute.

One criterion of success in the effort to obtain knowledge is the agreement of authorities. The complete failure, in this respect, of the purely speculative undertakings of human thought leads one to declare that the word "knowledge" should not be applied to their results. At the present time logic and psychology are not generally regarded as branches of philosophy, although they are included in the philosophic curriculum. The eminently philosophic "disciplines" are metaphysics (ontology), epistemology, and ethics, all of which are in an extremely backward state, and concerning the contents of the first of which—the most fundamental—hardly two philosophers can be found to agree. The facts force us to say that either the subjects considered by these three disciplines are unamenable to a method not solely speculative, or that they are not possible branches of knowledge and should be abolished. This being the case, the term philosophy loses its meaning and may be redefined.

The suggestion which I desire to make is that we return to the usage of the Greeks, and employ the word *philosophy* to designate *all general knowledge*. By general knowledge is meant knowledge which applies to all cases of a single kind, which consists of laws and principles, and is to be contrasted with *history*, which is the enumerative description of individual things and happenings. History, in the widest sense, furnishes the *data* for philosophy.

This redefinition of the term philosophy, however, is to be made with certain restrictions or implications. In the first place, it is made on the supposition that *the sum-total of all knowledge will form an organic whole*, in which epistemology, psychology, physical science, metaphysics, and ethics appear as closely interrelated, and to a certain degree interdependent parts. Secondly, it is supposed that each of the parts of philosophy rests to some extent, science as well as metaphysics, upon speculative "postulates," which, in fact, determine the non-speculative methods of work of the disciplines in question.

It may be objected that to define philosophy with such implications as this is to lay the entire system open to doubt, by making it speculative at the start; it is to found the conception of the whole structure of knowledge upon faith. The answer to this is that critical analysis will show that the second of the "suppositions" which we have mentioned is really a plain statement of fact, and that to accept it is merely to be frank with regard to the foundations of all knowledge, physical as well as metaphysical. It can be shown that

every valued form of knowledge rests upon certain pure acts of faith. In this way the system of philosophy, as we have defined it, has a characteristic in common with religion.

The first "supposition," that of the ultimate unity of all forms of knowledge, is one which, also, may finally be proven or disproven, as knowledge develops. In so far as the system of knowledge remains incomplete, however, in so far does this assumption lack justification, and to the same extent is our belief in it a matter of religious faith. It is this belief, however, which will urge the scientist and philosopher on in his tireless study of the details of things without which, even supposing his faith to be valid, that validity could never be demonstrated. However, if the faith is indeed valid, it should be possible, even in a relatively undeveloped state of the system of knowledge, to find some evidences for its unity, and hence to find them now.

Christianity and all of the world religions have a fatal and inevitable weakness. It consists in their lack of respect for knowledge. This lack of respect they exhibit in two ways, first, by assuming that nearly all ethically useful knowledge is compressed in their own creeds and, second, by supposing that any knowledge short of all knowledge can furnish a perfect solution of any practical problem. The weakness which accrues to our religions on account of this failure to respect knowledge has both a practical and a psychological aspect. Practically, the ignorance which it entails makes religion inadequate to solve most of our concrete difficulties in life; psychologically, a man's perception that religious documents are incomplete and fallible where they pretend to be final, leads him to distrust them in their totality.

The teachings of religious books with regard to the nature and origin of the universe are now discredited for the reason that they are not based upon, and are not in harmony with, a detailed study of facts. On the other hand, the conclusions reached by science command respect not only because of the detailed and careful studies upon which they are based, but on account of the fact that from these conclusions deductions can be drawn which are verified by experience, and which assist man in the attainment of his desires. Upon every science a successful art, or *technology*, can be founded. Technology, in this sense, is the force which has made our twentieth-century civilization powerful and distinctive, but which, sad to say, threatens now to annihilate it with an efficiency surpassing that with which it was constructed. It is the advance in technology which enables us to erect structures which the great builders of the ancient world would have deemed impossible; it is technology which has increased the rate of production, which has created our systems of

transportation and communication, and has thus made possible the growth of nations and a positive, if unstable, increase in human solidarity. Even the voyage of Columbus was an application of the science of Copernicus.

Modern technology has a moral significance, or at least, moral possibilities. It has increased the number of human beings upon the earth, as well as their average length of life, but has decreased the amount of labor *per capita*. At the same time, it has provided each man, on the average, with greater means for enjoyment than was previously possible. Without modern technology—and its development of labor-saving machinery—the abolition of slavery could never have been accomplished. To increase freedom and wealth, to conserve health, and to multiply life, are moral achievements of first-rate importance.

It is characteristic of all philosophical knowledge (in the sense in which we have redefined philosophy) to have an *inductive* and a *deductive* side. The former starts with data and generates principles; the latter starts with the principles and generates detailed applicable knowledge. Knowledge as a process or function is built on the same plan as organic response; induction corresponds to the stimulation of the senses, to perception and memory; deduction to motor discharge, volition, and adapted action.

What we have said thus far appears to apply satisfactorily to physical science, mathematics and logic, and perhaps to psychology, but hardly at all to epistemology, metaphysics, and traditional ethics. There is one among this latter triad, however, viz., *ethics*, which is supposed to be *par excellence* the guide to action. Yet the fact remains that the ethics which is classified as philosophy has been singularly barren of practical results. Most existing ethical treatises inspire the serious-minded reader only with impatience and disgust, since they lack both imagination and contact with the actual spirit and difficulties of life. They are often right as far as they go, but the extent of their progress makes ridiculous the dignity which attaches to them.

The reason for this is at one with that for the weakness of crystallized religions, with which academic ethics is closely affiliated: a final system for human conduct can not be found on less than the total system of inductive knowledge. Ethical writers have attempted to found it upon isolated minutiae. The majority of these writers have spent their energies in an attempt to find out what ethics is, and what its methods of reasoning should be. This is not an ethical, but an epistemological problem, and it has not been settled by the debates of the ethicists.

IV

From this discussion there emerges the view of the practical significance of philosophy and its unity which we have been approaching. Ethics is the deductive aspect of the total system of knowledge; it is *applied philosophy*, or technology in its broadest possible aspect.

Against this definition it will be urged that certain problems have been involved in classical ethics to which no answer is given in our present system of knowledge, which is almost exclusively scientific. Science does not tell us the "meaning of good," it does not answer that persistent question as to the nature of true progress. It shows man as an organism, his place in the biological world, but as a feeling, aspiring being, his existence and relation with the whole course of nature remain unexplained.

The answer to this objection is to be found in the observation that the acceptance of the results of physical, and even of psychological, science as the final system of knowledge is a characteristic, not of philosophy, but of a religious faith called *materialism*. This faith, like other religions, adopts a portion of the truth and treats it as if it were the whole. Hence its weakness.

The presuppositions of the method of science, physical and psychological, are such that its subject-matter is limited to what appears in the *experience* of individual human beings. Science deals only with what can be seen, touched, or otherwise sensed; and there is no scientific reason for supposing that these contents of the senses, "phenomena," are identical with, or even represent, anything beyond the senses. Now, philosophy concurs with religion in its assertion that the world of pure experience is not the sum-total of reality, and that there exists a world which is not, and may never be, presented in the senses. It will probably agree also that this extra-experiential universe is one, a knowledge of which will throw light upon the so-called spiritual problems of human life; that is, it will reveal the universal background of man's conscious and desiderative nature. The methodic study of this *problem of the part of the universe which lies beyond our experience* constitutes that branch of philosophy which we call *metaphysics*.

The most characteristic attack made upon metaphysics is based directly upon this very definition of the discipline as the study of the non-experienced. It is claimed that such a study is impossible, on the ground that only experience can be known. However, the individuals who make this attack upon metaphysics are among the first to employ implicit metaphysical assumptions in their own reasoning. The explanation of this fact is easily found: one who is a metaphysician without being aware of it is unlikely to recognize

the need of metaphysics. To suppose that matter, for instance, exists apart from your or my perception of it is to make a metaphysical assumption for which pure science gives absolutely no warrant. Moreover, for me to suppose that you, as a conscious mind, and not merely as a biological object, exist, is to involve myself in a metaphysical proposition which science does not even suggest.

These statements concerning the fundamentals of metaphysics and of science have been made many times in the history of human thought, but with only a barely perceptible effect upon the progress of thought, although they contain within them conceptions which, if analyzed, could furnish the abortive branches of philosophy with the basis which they need for fruitful development. The reason for this failure is obvious. It lies not in the impossibility of metaphysics, or any especial unclearness in the situations which are involved, but in the fact that practically nobody has any vital interest in the development of a methodic knowledge of the world which is beyond our experience. We instinctively concentrate our energies upon problems which appear to have practical importance, and metaphysics appears to have none. Those who, at the present time, devote the most energy to such questions find their final reward in the attainment of an academic degree, or the fundamental satisfaction of seeing their writings in print.

The essence of what I wish to convey in this article lies in a rebuke to this assumption that metaphysics has no practical significance. Metaphysics is the broadest of the studies of reality; it involves knowledge of the totality of existence. That part of the universe which lies within, and constitutes human experience may be so small that the contents of a finished science will be reduced to negligible proportions when compared with those of a finished metaphysics. It is more likely, however, that they will unite with the latter to form one system, the original division of which resulted only from the ultimately inconsequential fact that individual human experience has indeed a small scope.

If metaphysical knowledge is practical there must exist a possibility for *applied metaphysics*, that is, there must be a branch or aspect of *technology* which can be based only upon such knowledge.

It is relevant, now, to notice that the technology which is based upon science alone has appeared thus far to be applicable only to the *details* of practical problems. For example, applied mechanics tells us how to build a bridge, but it does not tell us whether we need to build a bridge. Whether we need to build a bridge or not depends upon what we desire to accomplish, say to transport people and goods across a river. Most of us would ordinarily regard such a desire as a laudable one. However, suppose the goods to be carried

over the bridge consist of guns and explosives to be used in killing our relatives and friends. In this case we are apt to condemn the proposal to build a bridge. However, there will be disagreement on this point between our enemies and ourselves; while we condemn, they will applaud. Here is a practical problem, in order to settle which we must employ principles broader than those of mechanics. From what pure science can we derive a technology to solve it?

A conceivable reply is that economics, and sociology in general, will furnish the principles which are required, by showing not only that warlike operations destroy wealth and happiness, but by revealing the methods which must be followed to bring wealth and happiness to a maximum. There is no doubt that economics will assist us, and that from the human standpoint, the questions which it will solve are broader or more general than those settled by biology or chemistry. However, even the application of the broadest economic principles presupposes some definite fundamental *motive*. Given this motive, a completed scientific system will enable us to deduce the means by which the motive can be maximally satisfied.

Here we find ourselves face to face with the broadest of all practical problems: What shall be my life purpose? Still further: What shall be the dominant motive underlying social organization, with the limits which it imposes upon individual freedom? The world has no lack of motives. The European struggle, and the almost equally heartless competition which exists between individuals even in times of peace, is at bottom a conflict of motives. This conflict represents a very practical problem, before which the problems solvable by applied mechanics and chemistry fade into insignificance. The ultimate success of applied science presupposes the successful operation of a technology which distinguishes between motives and chooses the correct ones as ultimate ethical postulates.

In order to decide which of two conflicting motives is "correct" it is necessary to possess a definition and a criterion of the correctness of motives. This may be accomplished by selecting a *fundamental motive with which all other motives must be consistent*. That chosen by Bentham and Mill as the basis of their economic teachings was the attainment of the greatest happiness of the greatest number. The adoption of this criterion, however, appears to depend upon the assumption that this is what each individual in a society actually and fundamentally desires. That this assumption is inaccurate is obvious; an individual does not even consistently desire his own greatest happiness, and has very little regard indeed for that of others. As a matter of fact, the human race is conscious of no unitary life purpose. The choices of the individual are governed in the last analysis by interacting instinctive tendencies, all of which point biologically

to race preservation, but which with the development tend less and less to subserve this function. Gasteur, hunger, the fear of pain, and hatred for our rivals among our important choices.

Both religion and traditional ethics have assumed that certain kinds of metaphysical knowledge could be the selection of a dominating motive. This has been especially with reference to the problem of personal immortality. The truth of this general assumption would mean that a metaphysics founded on the most comprehensive of the possible knowledge would provide a solution for the broadest of ethics. Metaphysics would thus demonstrate its utility on a question upon which science is silent.

If, in general, the correctness of a motive depends on its consistency with some motive more fundamental than itself, the inquiry concerning the correctness of a maximally general motive obviously implies that no human motive can be really ultimate. The correctness of any such human motive must be determined by its consistency with a *universal motive*. To discover whether such a universal motive exists, and if it does in what it is, is the fundamental task of metaphysics. Applied metaphysics then consists in the adjustment of social and individual human motives to this universal desiderative principle. Such an adjustment would provide the foundation for an ultimate definition of the good.

The belief in the possibility of this sort of applied metaphysics involves certain assumptions. In the first place, it presupposes that human life is a product of the nature and activity of the individual as a whole, and that the two have important common principles. Secondly, it assumes that the demonstration of the existence of a universal motive would be accepted by normal human beings as a adequate basis for the ultimate regulation of their conduct. The acceptance would be based upon the consideration that any individual constitutes a part of the universal scheme, all of his individual motives being products, however unhappy, of the progressive movement, so that to combat the universal motive would be to turn against the cause, the essence, and the excuse of his selfish appetite.

All this seems highly speculative and uncertain, but that if such an analysis would prove this appearance to be deceiving I firmly believe. To carry out such an analysis is the function of the philosophical discipline of *epistemology*, or the theory of knowledge, in demonstrating the unity and stability of philosophy as a whole. Epistemology will prove: first, that the common belief in the "objective" character of scientific knowledge, as compared with metaphysics,

physics, has no intelligent ground. This proof will show that all scientific knowledge depends upon the postulate of the "uniformity of nature," or the constancy of application of the general principles derived from the analysis of experience. This postulate has no conceivable intellectual foundation. It is actually based upon bare instinct, in which, consequently, is to be found the psychological cause of scientific positivism.

Epistemology will demonstrate, second, that any individual's belief in the existence of the mind or consciousness of any other individual can not be justified by scientific argument nor, indeed, by any other form of reasoning. The belief in "other consciousness," which has an instinctive basis as profound as that in the principle of uniformity, can be shown to constitute the fundamental postulate which, in combination with the results of science, furnishes the only necessary basis for a methodic metaphysics. The validity of the conclusions reached by science will depend upon the correctness of observations and the accuracy of the principle of uniformity. The validity of the results obtained by metaphysics will depend, similarly, upon the accuracy of its own characteristic postulate, and that of the conclusions reached by science.

To develop these conceptions in detail would be impossible in an article of this sort, so that any attempt to give them additional clarity will be foregone. The essential contention is that whatever may be the ultimate justification of what we call "common sense," its most profound attitudes provide a basis just as much for metaphysics as for science. Thoroughgoing skepticism reduces us to an intellectual state in which science seems as hopeless a task as does metaphysics. Methodic metaphysics will make no assumptions which any besides an insane or temporarily Pyrrhonic human being would reject.

V

The essential thoughts of this article may be summarized somewhat as follows.

Modern society, although based upon a systematization of details, reveals a chaos of fundamental purposes. To prevent such a chaos is the function of religion in society. However, the European war, and the general decline in the sincerity of belief during modern times, proves that Christianity is failing to discharge this function efficiently. The consequences for the progress of civilization, and even of man as a species, may ultimately be very serious. The dominant human motives are largely instinctive, and of such a nature that when released from some synthetizing control they produce highly destructive effects.

There is reason for supposing that the weakness of extant re-

ligions lies not only in the imperfection of their creeds, but in their general contempt for any knowledge not contained in these creeds. Whatever they contain of truth would necessarily be embraced also by a universal system of knowledge, to which we apply the name "philosophy." Such a system, when brought to completion, would possess all of the important characteristics of a religion. It would be founded upon certain fundamental acts of pure faith, it would form a unitary whole, it would not only assist man to attain his purpose in life, but would show him what that purpose is. This it would do by considering the world beyond the senses as well as that of direct experience. Philosophy would differ from any existing religion in that the principles in which it demands faith are such as can not be rejected without the destruction of the possibility of all knowledge; in that, beyond these principles, its method of construction would be that characteristic of science and logic and—most important of all—in that, being founded on what is fundamental in belief and what is real in experience, it would command the respect of humanity.

To build up such a philosophy something is required in addition to the results of empirical science. This is *metaphysics*, a much-despised discipline which in modern discussion is often identified with the whole of philosophy. Now *ethics*, we have said, is applied knowledge, knowledge in the service of human purposes, but a technology based upon science alone possesses a fatal deficiency. While it makes possible the control of our human environment in the fulfilment of existing human motives, it offers no criterion for the correctness of these motives in themselves, and hence can furnish no grounds for the solution of the world's most practical problems. To provide such grounds, by investigating the place of human experience in the total universe of which it forms a part, is the function of metaphysics. Metaphysics is the heart of philosophy, the ultimate goal of empirical science, the final culmination of the inductive movement in knowledge, from which proceeds that deductive movement which we have identified with ethics, or with technology in the broadest sense.

Our thesis has been that such a system of knowledge is not only possible, but is absolutely essential to the world's progress and peace. Science alone can not save us; alone, it may even prove our ruin. Existing religions, full of valuable truths as they are, are yet too shallow to command lasting respect. What we need is a system of thought, filling the place now occupied by religion, but possessing the strength of science. This can only be a system of which science is itself an integral part, and in which what we know of evolution, of protoplasm, of radioactivity, electrons, and energy,

form logical steps in an answer to the child's question: "What is it all for?"

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THE OBJECT OF PERCEPTION *VERSUS* THE OBJECT OF THOUGHT¹

INFLUENCED by pragmatism, we have become accustomed to thinking of perceptions as plans of action. As such, they are at once anticipations of motor adjustment and promises of result, pleasant or unpleasant. Although a perception is thus a plan of action it is also an interpretation in terms of past experience functioning as an ideal system. Movements are anticipated through ideas which are themselves universals and synthesize many experiences of motor adjustment; promised results take the form of ideal qualities, universal in their meaning.

But while the content of perception is ideal and thus possessed of universality, the object perceived is a particular thing existing here and now for a living individual. We assign the object of perception to a world quite different from that of our ideas; we attribute actual existence to the object we perceive. This we do because a perception is certified to at the time we experience it by objective reality. It is in fact an interpretation selected by objective reality. How, now, does reality select and thus confer objectivity upon certain of our interpretations? It does this by the control which it exercises over the movements which the interpretations instantly call forth. These are movements of adjusting the sensory apparatus, usually of sight and hearing. When these movements are permitted to proceed without hindrance and intelligence is stimulated thereby to fill out and complete the interpretation which evoked (the supplementary features being in their turn often followed by added movements which call to attention further qualities, and so on), the interpretation in question is verified; its existence as an object is perceived. When, on the contrary, the attempted movements are frustrated or prevented by objective conditions, the interpretation is rejected as invalid, the object which it supposed is proved non-existent, and another interpretation must be made.

A perception is therefore an interpretation based on past experience and inducing an immediate adjustment which if it proceeds unimpeded imparts objectivity to the interpretation. Unfamiliar objects are frequently perceived through a series of interpretations

¹ Read at the meeting of the Western Philosophical Association, St. Louis, April 21, 1916.

made under control of objective reality, each more definite than the last. When adjustments by which the living individual maintains his position are interfered with, he is forced to reinterpret his objective environment as the condition of a new adjustment. His first interpretation may be very general: he perceives "some sort of thing over there." This interpretation induces those movements of eye-muscles required to follow out with his gaze the definite outlines which such an existing object will have in contradistinction from a mere shadow. But such a vague general interpretation is only a beginning of a perception of the object. Suppose that an object has thus been perceived by me on the lower part of the table in the far corner of the room. The idea of a book first comes to my mind, but my attempt to trace the outline of the supposed book is frustrated by a sharp break on the upper edge. I think of a flat box which often sits on top of the table, but the broken line still impedes my attempted adjustment. Finally an idea of the box with the cover partly out of place occurs to me and the movements which this interpretation evokes are permitted to proceed unhindered, with the result that further details of the appearance of the box are suggested to my mind. Of course I perceive the object as a box with the cover partly off in much less time than this description consumes, but the description is nevertheless a true account of the process of perception.

We have agreed to define the perception as a plan of action involving both an anticipation of movement and a promise of satisfaction. Yet the movements by which the perception is verified are not ordinarily those which are anticipated in its meaning, nor are its qualities the results desired. The movements represented in the perception are primarily those of the whole body in appropriating the object, and the satisfactions are those expected when it is put to the use for which it is intended. The movements instantly evoked by the initial interpretation, however, are adjustments of the sensory apparatus suited to prove the existence of qualities in the object whose presence guarantees in advance of more extensive movement that the results desired will follow when these latter movements are made. Thus perception serves to forecast the results of action and thus to economize the effort of the agent. The movements by which we approach and utilize the object perceived constitute a further and more conclusive verification of the perception: the tactual sense is, as we say, the final court of appeal. But the process of verification, of realizing an ideal content, is the same in the case of action as it is in simple perception, the only difference being that as the course of action is more prolonged the essential factors are more easily discerned. The sequence of movements which idea or per-

ception suggests is actually undertaken. In case these intended movements are permitted to continue unimpeded, the qualities for which the object is desired are established and accentuated in the consciousness of the agent. It is through such interplay of movement and meaning, and this only, that an ideal content attains objective reality.

To summarize: the kind of existence possessed by the perceived object is determined by the control exercised by objective reality over human action, and, since by action is always meant the motor adjustments of an individual, the object of perception always exists at a particular time and place in an individual experience.

The thought-object, on the contrary, exists as a universal: not only has it content which is universal because ideal, but it has also existence which is universal because it generalizes individual experiences of effort and satisfaction. The concept is an identification of objects which play a similar part in all human conduct. The relations which constitute the meaning of such concepts are of two kinds because the functions which objects discharge in voluntary action are of two main sorts. Such objects are either links or steps in sequences of movement or else they are sources of satisfaction. Conceptual objects are therefore possessed either of spatial attributes, and thus subject to mechanical causation, or of the properties of freedom and inner development. The meaning of most common concepts (chair, table, house, etc.), is constituted by both these types of relation: they are at once extended objects having location, size, shape, etc., depending in their construction and use upon definite kinds of motor adjustment, and also objects of value having many possibilities of use and promising a variety of satisfactions. Systematic thought, however, tends to distinguish ever more sharply between these two kinds of meaning, separating mechanical concepts from concepts of value. Natural science eliminates all secondary qualities from the physical world and conceives it entirely in terms of motion, and materialistic philosophy endeavors to expel the teleological principle from the domain of thought altogether. Religious thought, on the other hand, seeks to subordinate matter and mechanism to purpose and freedom, while idealistic philosophy attempts to organize all objects of thought within the unity of a single comprehensive purpose.

But how, one may ask, do concepts gain objectivity? They claim to be true, to agree with reality. Are our thoughts subject to any control comparable to that exercised by objective conditions over our movements. Such control, or one analogous to it, is exercised over our thinking, by the accepted body of knowledge. This sums up and systematizes man's experiences of pursuit and attainment;

it rests ultimately upon the direct verification which the ideas of individuals receive in perception and action. Accepted knowledge requires all thoughts to be consistent with itself if they are to share its objectivity. Such consistency is tested in different ways. The thought in question may be identical with an idea already verified in points so essential that the realization of the former is imagined in so vivid and convincing a fashion as to impart to it objectivity. More commonly the system of generally accepted knowledge controls the thinking of individuals through the instrumentality of the speech-mechanism. Accepted truth is formulated in discourse, oral and written, and received by the individual through social heredity. Every new thought he must put in words; every new conception he must define in language. If knowledge already formulated offers no hindrance to the new proposition by contradicting wholly or in part, but rather, by implication, gives it support, it is also accepted as true. In case contradiction or confusion does arise, of course the idea is rejected.

Thought-objects are generalized experiences of action or appreciation; their universality is based upon the unity of will characteristic of all human individuals. Thought represents objects that are possible of realization by all voluntary agents. In the nature and workings of volition, therefore, we find the desired explanation of the opposition between conception and perception, thought and existence. To the regular operation of will two activities are essential. First, a choice must be made among ends in accordance with the promise of satisfaction they severally hold forth. Objects when thus considered as ends are conceived, being the generalized results of past experience, individual and racial, and involving conceptions of movement and result. They are also ideal in the sense of being non-existent, because out of harmony with the actual motor adjustment of the individual. If such an end, once chosen, is to be realized, the second power essential to the operation of volition must be exercised. The sequence of movements believed necessary for the realization of the object must be actually initiated and carried through. Only such movements can be made as objective reality permits, and these movements transform the chosen end from a mere idea into an existing object in case they succeed in finally bringing about such a harmony between the motor adjustments of the agent and the qualities he desires to experience that the movements actually at his command are such as maintain and intensify these qualities in his consciousness. In this unique experience of satisfaction or fulfilment an idea which in its meaning gives expression to the unity and freedom of personal volition acquires objectivity because it is brought into definite connection with the system of movements which the

agent is permitted to make, and is thus constituted a point of departure for the direction of further movements. When in this way an object is once realized through activities that can be observed, remembered, and described, it can be re-experienced at will by human individuals. It is consequently given a place in the objective order, the world that exists for all voluntary agents. This actual world is a conceptual system; the objects which compose it are universals because they represent possibilities of realization for all human individuals. The realization of an end involves, as we have seen, the cooperation of the two activities of selection and movement. The two fundamental types of relation by which experiences are correlated and given meaning as objects of thought are those of mechanism and teleology. If we add to these the principle of identity based upon the underlying unity of volition itself, we have the three fundamental thought-forms or categories.

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PURPOSE, CHANCE, AND OTHER PERPLEXING CONCEPTS

IN a recent note on my discussion of the entelechial interpretation of purpose,¹ Professor Lawrence J. Henderson appears to rest his own theory of teleology on the "uniqueness" of a certain ensemble of physical and chemical characteristics of the three elements which figure most prominently in organic compounds. It was against this very type of argument that my criticism was directed. In medieval science this mode of reasoning was common enough. The circle is a unique figure; hence the planets *must* move in circles. Seven is a unique number—the highest prime under ten; hence, there must be seven planets; there can be no more, no less. With all due appreciation of Professor Henderson's wide knowledge of chemistry and physics, it would seem that he has selected a lot of striking characters, enumerated them, called the combination "unique," and from this has argued to a teleological view of the universe.

Against this conclusion it may be urged, (1) that "uniqueness" of itself carries little weight, since there are hundreds of "unique" combinations of properties in the world, some of which are important, others not. (2) That the *value* of the "unique" combination of characteristics which Professor Henderson has studied can only be determined by making a corresponding study of the *unfit* characteristics which go with them. This would furnish the denominator of the fraction whose numerator Professor Henderson has (I believe) very fairly evaluated.

¹ This JOURNAL, Vol. XIII., pp. 325 ff.

Professor Jared S. Moore points out in a note² a confusion due to my use of the word *chance* in two distinct senses. (1) When we speak of the two alternatives "design" and "chance," the latter is generally understood to mean either an uncaused result or at least unregulated causation. (2) The notion of *chance variation* in the natural selection theory is somewhat different. When one meets a friend "by chance" we suppose two separate series of events, each of which by itself is causally determined; but the conjunction of the two series at this particular point is not the result of either set of causes. This is, I believe, a legitimate scientific use of the term *chance*. The variations in plants and animals which natural selection works upon are of this sort. Each parental germ-cell is causally determined; the combination of characters in the offspring, though fully "determined," is nevertheless a "chance occurrence" in this sense.

Professor Moore's criticism of my ambiguous use is justified, but I can not agree with the deduction which he draws. Use two words instead of the single word *chance*, or spell Chance with a capital in the first sense, and his objection to admitting that science is the final arbiter in interpreting purpose seems to disappear.

In the judgment of certain other critics my examination of teleology fails to take into account a third alternative cherished by many philosophers, an interpretation which is *neither* entelechial nor mechanistic. Possibly they are correct. Despite many earnest endeavors I have never succeeded in mastering any "philosophical" exposition of teleology from Kant to Bosanquet that has come to my attention. Might it not be worth while for some philosopher to write a "primer" of teleology from this standpoint, for the benefit of the plain every-day scientist who is interested in the problem?

Meanwhile it would seem desirable for mechanistic scientists to avoid using the term *teleology* in their expositions on account of its ambiguity. Till recently I believed it to be a proper equivalent for *the science of purpose*. It appears to be used also to include *harmony* and *trend*, which are quite different concepts and should not be confused with purpose.

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REVIEWS AND ABSTRACTS OF LITERATURE

The Circulation and Sleep: Experimental Investigation Accompanied by an Atlas. JOHN F. SHEPARD. New York: The Macmillan Company. 1914. Pp. ix + 83.

The author of this work measures the blood supply sent to the brain

² This JOURNAL, Vol. XIII, p. 158.

during sleep, in order to determine, if possible, whether sleep is due to anemia, hyperanemia, or to some other cause. He believes that the most accurate method of studying cerebral circulation "is to obtain a record of brain volume together with tracings of general arterial pressure, and in some cases a venous pulse."

Two normal male subjects were employed; one of them had been trephined over the right ear, the other on the right side of the forehead. Besides obtaining objective records of the volume of the brain, of the volume of the periphery (hand or foot), as well as curves of breathing, blood pressure, heart rate, transmission time of pulse wave over the body, and of the jugular pulse, the experimenter asked his observers to give a careful introspection whenever they woke during the experiment or at the end of it.

The major part of the monograph is devoted to a detailed explanation of the plethysmographic tracings, which come separately bound and comprise the Atlas.

The main results of the investigation, however, may briefly be summed up as follows: In all positions of the subjects, and whether sleep came rapidly or slowly, there was a marked increase of the volume of the brain as sleep came on. This increase was greatest from fifteen to twenty-five minutes after the subjects had fallen asleep and thereafter it diminished somewhat, but always during sleep the brain volume remained greater than during wake. The absolute values of the volume-changes were between 0.3 cu. cm. and 0.7 cu. cm. Weak stimuli given during sleep caused a fall of the brain volume, but stimuli given during waking caused an increase thereof (p. 37). Waking brings a fall in brain volume, and in general a reverse of the conditions occasioned by sleep. Shepard also noticed that when stimuli were given to the sleeping subject, the responses, as indicated by the tracings from the brain, were perceptibly delayed. Whence he concludes: "There are very definite indications that the circulation change lags behind the mental process" (p. 38).

In view of his findings Shepard declares that the anemia theory of sleep can not be accepted. Neither is sleep due to a separation of dendrites and axons occasioned by the expansion of the cerebral vessels, since there is a similar expansion of these vessels when the subject is stimulated in the waking state. Moreover, the circulation change lags behind the mental process, therefore the relaxation of the brain vessels with sleep and their constriction with waking must be regarded as an effect, not as a cause, of sleep.

Though it is true that sleep may be facilitated by habit, "that one may learn to sleep best in a given environment," just as one learns to attend actively, still this does not always mean that sleep is promoted by withdrawing from external stimuli (p. 77).

What, then, is sleep, and what is it produced by? When sleepiness is analyzed introspectively, says Shepard, it is usually described as "a yielding to the force of gravity," "yielding to heaviness," "becoming lost in rest sensations." These "rest" sensations seem to come from all the muscles of the body; and that is the most noticeable fact about the process

of going to sleep. In short, as we fall asleep "we become absorbed in a mass of fatigue sensations" which tend slowly to inhibit other processes, especially motor activity (p. 78). Sleep, then, "consists of a group of sensations of fatigue or rest, . . . sleep itself is a more complete rest," and "the process is a dominance of an organized group of these sensations."

The work is a valuable contribution to the literature of this little understood problem. It shows much ingenuity in technique, and therefore should be very suggestive to physiological psychologists. As the title indicates, it is an investigation that offers more to physiology than to psychology. The only distinctive psychological proposition is the denial of the anemia theory of sleep and the affirmation of the view that sleep is a complex of "fatigue or rest sensations" which inhibit all motor activities and particularly strain sensations.

To speak of sleep, however,—of the bodily state in which all consciousness is lost—as a group of "rest sensations" is equivalent to talking about an unconscious consciousness. A sensation is a mental process, and dreamless sleep is the arrest or the non-existence of all conscious processes; therefore, sleep can not be the "dominance of an organized group of these (rest) sensations." But suppose we assume that Shepard refers to these fatigue sensations as existing only during the process of going to sleep (which is very true), and that they disappear the instant the subject has thoroughly gone to sleep. What is it that keeps the individual in the sleeping state? We should suppose that with the disappearance of these fatigue sensations—these inhibitors—from consciousness, the motor activities which they inhibited a moment ago would pop up again, and the subject would be awake once more.

This subject might have been discussed more fully. It is possible, however, that Shepard will agree with some such view as the following: The fatigue sensations not only inhibit motor activity, but also establish a certain amount of sensorial inertia, *i. e.*, they raise the sensory threshold. The inhibited state of the sensory and motor centers constitutes sleep. Then the continuation of the "rest" or "fatigue" sensations is not necessary to keep these centers in a state of inhibition, for this is maintained by the sensorial inertia that has been established in the first instance. Hence a stimulus of a more intense nature than will ordinarily affect consciousness is required to wake a sleeping individual.

The sensorial inertia view seems to be supported by one of Shepard's own findings. Whenever a stimulus was given to the sleeping agent, there was a considerable delay before the plethysmograph recorded a change in the brain volume. This, the author says, shows that the circulation change lags behind the mental process. But why bring in the term "mental process"? All that the records show is a temporal difference between the application of the stimulus and the circulation change in the brain. May it not be likely that this delay measures the time that it takes a stimulus of the kind given to overcome the sensory inertia?

At this point, however, it will be asked: Suppose sleep is a state that is synonymous with inhibited motor activity, and suppose this state of inhibition is maintained or guarded by the raised sensory threshold, how then

does the sleeping subject manage to wake naturally, i. e., of his own accord? It may be answered: first, the stimuli of the dawn—light, sound, etc., are, as a matter of fact, more intense than those that prevail at night; and secondly, there is a radical change in, usually an intensification of, the organic sensations, that overcomes sensorial inertia.

It may also be asked whether the author disproves the view that sleep is produced by and consists of a separation of the dendrites and axons. The evidence he presents against this theory is that there is an increase of brain volume when the individual is stimulated in the waking state, by a drug or what not, and he does not, of course, collapse in sleep. But this argument assumes that there exists a causal relation between the increase of brain volume and the contraction or the separation of the dendrites and axons. No evidence in support of this view is presented.

The author declares that the utility of the relaxation of the brain vessels during sleep "may be that the effective building up of energy-giving substance in the brain requires greater circulation than is demanded by other parts" (p. 78). This is no doubt true. In this connection, however, it might have been worth while to study the brain volume in artificial sleep, i. e., sleep produced by drugs and hypnotism. It is often claimed that artificial sleep is not restful or recuperative. Comparing the blood volume in the brain during the two kinds of sleep might have thrown some desired light on this subject.

It is obvious, however, that too great demands can not be made on observers in experiments that are so taxing as these. The author is to be congratulated on the neatness of the records that comprise the Atlas.

GUSTAVE A. FEINGOLD.

CLARK UNIVERSITY.

War and the Ideal of Peace. A Study of those Characteristics of Man that Result in War, and of the Means by which they may be Controlled.

HENRY RUTGERS MARSHALL. New York: Duffield and Company. 1915. Pp. 234.

"As long as human nature remains what it is, wars will occur" says many a "practical" man. That human nature will, as a matter of fact, remain what it is he takes for granted. In this assumption he appears to have the support of biology and psychology. For does not war proceed from our instincts, which are the deepest-rooted parts of our nature, and is our nature anything more than a part of the general system of nature with its universal laws? How can the outlook, then, be anything but depressing for those who feel the horror of the present situation?

The main problem of Dr. Marshall's book concerns the validity of the supposedly scientific belief that since war is an expression of our nature and therefore of natural law, it must be expected to recur again and again indefinitely. This is not an isolated question. It involves the whole problem of the relation of ideals to natural law. The author accepts without qualification the assumption that war does express our nature, and that our nature is part and parcel of the natural order that the sciences endeavor to describe in purely mechanistic terms. He denies,

however, that the universality of law, or determinism, implies any set of fatalistically fixed outcomes. Fresh creations, reversal of tendencies, unprecedented products may well occur within a system of universal law. At the points in our experience where ideals are born, whether in cool reflection or in sudden intuitions, we seem to be participating in actual creation. And this is more than seeming. Ideals are not mere reflections of the past or transcripts of the present; they are, in very deed, new creations. Here nature takes exception to itself, as it were, and begins to reverse or redirect some of its procedures. Creativeness could be asserted merely from the existence of the ideal as an idea; but ideals do not stop here—in some measure they secure their own realization. It is a historical fact that men have progressively restrained and redirected their instincts. Human nature does not remain the same; it remakes itself.

Herein Marshall sees no exceptional fact, but a general quality of the universe. The psychic interpretation that we give to the reactions of our neighbors and of animals can not be withheld from plants or from any part of nature. Our ideal strivings are only vivid instances of a creativeness that goes on at some rate, perhaps slowly, even in the inorganic realm. Yet the coincidence of law and creation does not imply any fatalistic certainty that ideals will prevail. Things acquire moral quality because we will have it so. War will become immoral only when we repeatedly and persistently insist that it shall be so. For a few centuries—only a yesterday as measured by cosmic standards—we have been putting a moral issue into this phase of nature. War has been mitigated; its occasions have been more and more avoided; more sorts of war have been brought under condemnation. The final cessation of war is to be sought, Marshall thinks, partly by condemning it altogether, and hence risking attacks for which we may not be fully prepared.¹

The discipline of our pugnacious instincts must be carried out, the author thinks, individual by individual. It must be self-discipline fostered by carefully planned systems of education. He is under no illusions as to the magnitude of such a task. No political device, no international conventions can abolish war. Its roots in individual minds, official and unofficial, must be reached. National covetousness, lust of power, the secret enjoyment of fights and violence must be overcome. We must stop inculcating the fighting spirit in boys, abolish competitive games that, like football, depend upon physical combat, and we must cultivate humane sentiments and the spirit of religion (here defined, as in his "Instinct

¹ On this point Marshall is so brief that his meaning appears not to be quite clear. National disarmament is made parallel to the already accomplished disarmament of individuals. But the reverse side of disarming individuals is the creation of a police power for the enforcement of the individual's rights. Whether the road to national disarmament involves the creation of a parallel international police ready to use force to maintain rights, we are not told, or whether the use of force under such conditions is to be construed as war. Again, Marshall seems to argue for reduction of armament in the United States on the ground that if we are alert we can assemble sufficient power for defense when the emergency arises. This hardly looks like a condemnation of all war.

and Reason," as a contentless self-restraint that gives conscience a chance to be heard).

This is sturdy ethical idealism. It should sustain the spirit of many whose confidence in human nature has been undermined by the present war. But most noteworthy of all, I should say, is the turn here given to the theory of creative evolution. It is probably because of the affinity of his position with that of Bergson, as well as because of contrast in the grounds for it, that Marshall feels himself to be in opposition to the French philosopher. Marshall's emphasis is primarily upon direct experience of the ideas that we call ideals, and secondarily upon the observed efficiency of ideals in the natural order. The doctrine that creativeness is here experienced and observed is, of course, not new. What is fresh, even if it is not unprecedented, is the setting given to this doctrine in modern psychology and in a strictly scientific view of natural law.

GEORGE A. COE.

UNION THEOLOGICAL SEMINARY.

JOURNALS AND NEW BOOKS

THE PHILOSOPHICAL REVIEW. March, 1916. *Philosophy and Common Sense* (pp. 103-120): A. C. ARMSTRONG.—The origin of philosophical ideas in popular thinking has often been a matter of discussion. Less attention has been given to the influence of philosophy on common sense, for philosophy is involved in the genesis of common sense. "The speculative results of one generation have become the common inheritance of later times," as, for example, the principle of the uniformity of nature, the distinction between mind and body, and the theory of evolution. The influence of philosophy in molding the environment is constitutive of the philosopher's chief reward. *The Parmenides of Plato* (pp. 121-142): PAUL E. MORE.—A classified survey of the many interpretations of the "Parmenides," followed by the author's own view. The main purpose of the "Parmenides" was "to bring relief to Plato's own doctrine of Ideas." The aim is to save the Parmenidean unity from Eleatic and Megarian eristic, according to which both the existence and the non-existence of the one lead to equally absurd contradictions. Thus the reality of Ideas is independent of eristic. *Reason and Feeling in Ethics* (pp. 143-167): A. K. ROGERS.—Starts from Mr. G. E. Moore's thesis that the concept of the "good" is "ultimate and *sui generis*." Defines the good as "that which reveals a capacity, on reflection, for calling forth my approval; and that the only thing which I find common to the various object of approval is the ability to give satisfaction, or pleasure." Thus, in addition to a feeling of satisfaction, there must enter a judgment of approval, and this is an intellectual matter. There follows a detailed analysis of the conditions and basis of "approval." *Proceedings of the American Philosophical Association; The Fifteenth Annual Meeting, University of Pennsylvania, December 28-30, 1915* (pp. 168-181): Brief notices and short

abstracts of important papers. List of Members. *Reviews of Books*: Anthony, Earl of Shaftesbury, *Second Characters, or the Language of Forms*, Edited by Benjamin Rand: ERNEST ALBEE. Herbert L. Stewart, *Nietzsche and the Ideals of Modern Germany*: FRANK THILLY. Hans Driesch, *The Problem of Individuality*: CHARLES H. TOLL. Wilhelm Windelband, *Einleitung in die Philosophie*: EDWARD L. SCHAU. *Notices of New Books. Summaries of Articles. Notes.*

Johnston, G. A. *An Introduction to Ethics*. London and New York: The Macmillan Company. 1915. Pp. x + 254. 3s.

Lyon, Darwin Oliver. *The Relation of Quickness of Learning to Retentiveness*. *Archives of Psychology*, Number 34. Edited by R. S. Woodworth. New York: The Science Press. 1916. Pp. v + 60.

Morgan, John J. B. *The Overcoming of Distraction and Other Resistances*. *Archives of Psychology*, Number 35. Edited by R. S. Woodworth. New York: The Science Press. 1916. Pp. iii + 84.

Richardson, Robert P. and Landis, Edward H. *Numbers, Variables, and Mr. Russell's Philosophy*. Chicago and London: The Open Court Publishing Company. 1915. Pp. 33.

NOTES AND NEWS

SIGNOR LEONARDO BIANCHI is a member of the new Italian ministry as a representative of the party he leads—that of the Constitutional Democrats. He is professor of psychiatry in the University of Naples and director of the university clinic for nervous and mental diseases, and it is understood that he will devote himself to hygienic and social problems arising out of the war.

GEORGE ORDAHL (Ph.D., Clark University), formerly professor of psychology and education at the University of Nevada, and for one year state psychologist, Lincoln, Illinois, now connected with the Buckel Foundation for the study of backward and defective children, Stanford University, has been appointed psychologist and educational director of the Sonoma State Home, Eldridge, California.

THE mathematicians of the Scandinavian countries, including Finland, will hold a reunion at Stockholm, from August 30 to September 2. The International Congress of Mathematicians was to have been held there at this time, but European conditions have rendered such a meeting impossible, and this reunion therefore serves as a partial substitute.

PROFESSOR MARY WHITON CALKINS, of Wellesley College, has been appointed lecturer on the Mills Foundation in the department of philosophy of the University of California for the half year ending December 31, 1916. This lectureship was held for the past year by Professor George H. Palmer, of Harvard University.

THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

VALUE AND EXISTENCE¹

INTO the confusion of opinion which gathers about this topic, the philosopher who has learned discretion will venture only with the greatest care and trepidation. The philosophical triangle, existence—truth—value, has shown itself susceptible of almost endless manipulation, with resulting endless confusion. One hears of “values” as existing² and of existence as a value,³ and again both propositions are denied as palpable absurdities. It is said that “there is not a further something called value over and above the thing; the value is part of the complex set of experiences that make up the thing”;⁴ but it is affirmed with equal conviction that “value is never part of the nature of any thing.”⁵ In one breath we speak of truth as a value belonging to judgments as such, and in the next

¹ Read in part before the American Philosophical Association, December, 1915. Whatever may have been the feeling of other members of the Association as to the results of our discussion of the topic “Value and Existence” (I have understood that there are some who have felt that it did not take us far), I must confess to having benefited greatly. But while I have learned much, especially from the papers of Messrs. Perry and Sheldon, I must say that I was greatly disappointed in the lack of any fundamental and explicit discussion of the difficult problems that gather about the question itself as propounded by the committee. I say explicit discussion, for that the problem was touched upon by implication goes without saying. It could not be otherwise. But as I have sought, since the meeting, to make clear to myself these implications as to the relations of existence and value, I have found them so confused and so contradictory that the desirability of a specific treatment of this topic has been more and more impressed upon me, and its relative neglect in the discussions of the Association has seemed more and more a matter for regret. This is my excuse for the publication of this paper, the only one which dealt specifically with the question. Though changed in detail and considerably expanded in essentials, it remains the same.

² Dewey (and the pragmatists in general); Sheldon; Perry.

³ Windelband; Rickert.

⁴ Baldwin (from whom the quotation is taken); and many pragmatists and realists.

⁵ Fisher, “The Problem of the Value-Judgment,” *Philosophical Review*, 1913, Vol. 22, p. 637 (from whom the quotation is taken) and Simmel, in numerous connections, but especially, “*Philosophie des Geldes*.”

we talk of the beautiful and the good, and other forms of value, as being special types of truth. There is scarcely one of the possible permutations and combinations of these three terms that has not had a serious representation in philosophy.⁶ In consequence, "value" has, in the last decade, been a word to conjure with and, as every one knows, sleight-of-hand performances have not been lacking. The ideas, existence and reality, have always been equivocal, but with the prominence which the value notion has achieved in modern philosophy, their inherent ambiguity has lent itself to all sorts of legerdemain.

Of this situation, I take it, the philosophical world is not wholly unaware. We know that we have been using the terms value and reality in different ways, and yet we are just beginning to make an effort to clarify the situation. It is generally recognized that there are at least *two* distinct uses of the value notion and in various quarters one may see evidences of an effort to distinguish clearly and consciously between what is called a "narrower" and "broader" use of the term.⁷ The need of some such distinction is at least indicated by Münsterberg's paradoxical statement that the "relative" values, as, for instance, those of economics, are really not values at all. Extreme as it is, this view serves at least to indicate a real cleavage in thought. Only by such ambiguity in the value concept (and as we shall see later in the concept of existence also) is it possible to say, as Münsterberg does, both that "value exists" and "existence is a value."

It is with this problem that the present paper will be largely concerned. The ambiguities in this notion have their source, I think, in the verbal forms of the "value-judgment" itself. There are at least three usages of the terms worth and value, each of which has been the starting-point for specific definitions or notions of value. The first of these is adjectival: A is valuable (or good); and in this the subjective reference to feeling or desire is uppermost. This is usually taken to be the normal form of the value judgment, and from it the concept of value in the narrower sense (the relational) is developed. Again it is said: A *has* value and this form of speech leads to the concept of value as a quality. But finally there is also the judgment, A *is* a value. This we may call the substantive form. Following out this clue, there are those who conceive value as an entity or a form of objectivity.

⁶ The discussions of the Association serve to bear out this statement, every one of these positions being represented, one or two of these contradictions appearing at times in the same paper, as, for instance, in Kallen's "Value and Existence in Art and Religion." The two statements, value exists and existence is a value appear throughout Münsterberg's "Philosophie der Werte."

⁷ Felix Somlo, "Das Wertproblem," *Zeitschrift für Philosophie und Philosophische Kritik*, 1912, Bds. 145 and 146.

It is chiefly in connection with the first form of the value judgment that the "narrower" conception of value has been developed. Thus Somlo, speaking of the two types of value notions, notes that the first defines value by referring it to desire or feeling. The second, much broader, recognizes absolutely valid values independent of any relation to a subject. This is indeed an important distinction, and upon this narrower conception the "scientific" study of values has usually been based. Value is an attribute of objects, but since it is not confined to any particular class of objects, there being scarcely any object that can not under circumstances have value, the nature of the predicate is not determined by the object, but by its relation to a subject. But while this relational concept is generally characteristic of the narrower view, it is, I think, not necessarily so. It includes also the conception of value which develops out of the second form of the value judgment, namely, that which holds values to be *qualities* of objects independent of the subject and for which feeling furnishes merely the requisite sensibility. Meinong,⁸ for instance, holds to this view, at the same time characterizing it as the "narrower" and contrasting it with the broader view, against which he finds serious objections. The broader view, on the other hand, is a development of the substantive form of the value judgment. It involves, in the first place, an expansion of the value concept to include ideas not ordinarily associated with it in popular thought. Thus in contrast to the narrower views which, when they speak of value, mean the value of objects (economic, ethical, esthetic) and think of this value either as a relation of the object to a subject, or as a quality of objects, the broader view speaks of existence and truth themselves as values. Value is expanded to include *validity*. As a consequence of this, and in further contrast to the narrower views, the question is raised whether value is a form of being at all—whether, in fact, existence itself is not a value concept, and all distinctions in being, value distinctions. Perfectly consistent with the narrower view of course are the conceptions of the existence of an object or the truth of an idea, *having* value. But that is quite different from the reduction of logical validity to a form of value, or saying, with Somlo, for instance, that ultimately truth is the only value.

As to the justification of this expansion of the value concept so characteristic of present philosophical thought we need not now inquire. It may be that it is wholly unwarranted—an extension against which the usages of speech are decisive.⁹ It may be that the entire conception of absolute values is an hypostatization, a vicious

⁸ Meinong, "Für die Psychologie und gegen den Psychologismus in der allgemeinen Werttheorie," *Logos*, 1912, Vol. III.

⁹ Meinong, *op. cit.*, p. 13.

abstractionism that erects relations or qualities into entities.¹⁰ It may be, on the other hand, that this second value conception, as employed, for instance, by the Neo-Criticism of Rickert and Windelband, has an important place in epistemology. The significant point for us is that it is a *different conception of value* and that to the failure to recognize this fact our incoherence on the question of the relation of value to reality is chiefly due.

The primary object of this study is just this problem of the relation of value to existence and reality. It is in connection with the different conceptions of value—which in turn go back to fundamental forms of the value judgment—that the problem arises. Evidently this involves the entire question of definition about which there has been so much discussion. At the very outset we find this distinction between narrower and broader views all-important. Thus for the broader view value is generally, and perhaps must be, strictly speaking, indefinable. "We use," says Rickert,¹¹ "this word [value] for an idea that admits of further definition no more than being." Value, he tells us, is itself neither an existent nor an attribute of existence. Value is simply valid. For the narrower view, on the other hand, value is held to be definable as subsumable under some category of existence or being. I propose then to consider these definitions formulated by the "narrower" view. What are the categories of existence or being under which value may be placed? If under none, how is it to be conceived? Is value a quality or a relation? If so, how is it to be differentiated from other qualities or relations? Perhaps it is neither. If so, what is it? To these questions the present paper will be devoted, mainly, however, as a preliminary to the more ultimate questions to be considered later.

II

It need scarcely be said that an ultimate definition of value is concerned only with intrinsic value, all extrinsic or instrumental values going back ultimately to concepts of intrinsic value. For the narrower view intrinsic value has generally been conceived as definable—conceivable as some specific quale or relation. Let us now examine these attempts to define value.

They may be conveniently classified from two points of view, the principles of classification crossing one another. In the first place value is conceived either (a) as a quality of objects; or (b) as a relational attribute, the relation in question being either a relation of the object to the desire or feeling of a subject or some unique relation of

¹⁰ Lüdemann, "Das Erkennen und die Werturteile," Leipzig, 1910, pp. 13 and 14.

¹¹ "Zwei Wege der Erkenntnistheorie," Kantstudien, 1909, Vol. XIV., p. 37.

the object to other objects. In the second place definitions of value may be divided into psychological or ontological, according as the quality or relation in terms of which value is defined is found to be subjectively determined or not.

Let us consider then the relational definitions. As I have said, they may be divided into the psychological and ontological.¹² For the former, value is a function of the relation of an object to the affective-volitional tendencies of a subject; it consists in the fulfilment of interest. For the latter, it is determined by relations of fitness and harmony and may be defined as fulfilment of any tendency.

In these two forms of the relational definition we find agreement as to the *genus* under which the value relation is to be subsumed, namely, fulfilment of tendency, the difference of opinion relating to the *differentia*. This is really the question of subjective or objective definitions of value, which we may leave to a later occasion. Here we shall confine our attention to the critical consideration of the relational aspect. We shall find, I think, that it involves in both its forms a definition in a circle.

This criticism of circularity has been brought against the definition in its subjective form and by representatives of the ontological definition themselves (Sheldon). Why, it may well be asked, should fulfilment of interest be a good? Why should pleasure confer a value? In all such definitions valuableness is already assumed—as an intrinsic quality of pleasure or of fulfilment, as the case may be. But the circularity of the definition appears in another way. The value of an object consists, it is said, in its satisfaction of desire, or more broadly, fulfilment of interest. But it is always possible to raise further questions which show conclusively that the value concept is already presupposed. Is the interest itself worthy of being satisfied? Is the object worthy of being of interest? In other words, the fact of intrinsic value requires us to find the essence of value in something other than this type of relation.

For the ontological or cosmological conceptions this “worthiness” is to be found only in the objective relations of the object in question to other objects or parts of the universe: relations of harmony or teleological dependence. The deduction of value from the concepts harmony or purpose and end is, however, generally recognized as circular in character. Purpose and end presuppose value, not value purpose and end. On the other hand, the concept of “harmony” presupposes a whole which itself must have value on some other ground if the parts are to have value through relation to the

¹² Represented in the discussions of the Association by Perry and Sheldon, respectively.

whole. It is doubtful, however, whether we can ascribe value to the whole of reality, whether we can say of such a whole that it is valuable any more than we can say of the whole of matter that it is heavy. With the very idea of value is bound up the notion that beyond the valued object, or value, is another value, more or less. The idea of "totality" seems to be as foreign to the value notion as to the categories of fact.

Sheldon, whose definition we have taken to illustrate the relational type, thinks to escape these difficulties by substitution of tendency for end, thus defining value as *fulfilment of any tendency whatsoever*. It is true he looks upon this definition as the result of an exhaustive inductive analysis of all cases of value—and I would not deny the value and suggestiveness of this study—but the important point is that logically it consists merely in the substitution of tendency for end. Tendency is a purely factual category; and it is held that in defining value in these terms the difficulties that attend the other definitions are avoided. Is this so?

That this type of definition has peculiar difficulties of its own can not be denied. One who holds it must be willing to say not only that the light is a value to the tree, but even that the dike is an evil to the tide. To me such a way of speaking is simply unintelligible. Whatever meaning it has to others must, it seems to me, be due either to a surreptitious personification which can not be overcome, and which really imports purpose into the tendency, or to a tacit assumption of the value of the whole and the deduction of the value of the parts from that of the whole.

But important though it is, this is not the point I wish to emphasize here. I am willing for the sake of argument to admit the purely factual, value-free character of "tendency." But that still does not save the definition from being circular. For to say that the furthering of a tendency is to that tendency a good is to imply that furthering or fulfilment is in itself a good, and why after all should it be so? I think there can be no doubt that this definition gets its meaning only from the assumption that fulfilment is better than non-fulfilment; and just as little doubt that this assumption can be questioned. In any case value is assumed, the value relation "better than" being already assumed in the definition.

To this it is answered: "Good is no doubt a different notion from fulfilment, and therefore appears to contain something not authorized in the content of the latter notion. But that is because good or value is the relation between the fulfilment (or furthering) and the tendency, a relation uniquely and sufficiently determined by the two."¹² I am not able to see that this answer meets the difficulty.

¹² Sheldon, *op. cit.*, p. 122. This is his reply to the above criticism of his definition as made by the present writer in the discussions of the Association.

The relation between tendency and its furthering or fulfilment is doubtless unique, but that it sufficiently determines the notion good must be denied. It appears to do so only because the value notion is already imported into the relation—in the assumption that fulfilment is better than non-fulfilment. Without this the equating of the relation with “good” is meaningless. That the later stages of becoming are better than the first can never be more than a groundless pronouncement.

5. The fundamental difficulty then with both types of the “relational” definition—whether in its subjective form, as fulfilment of interest, or in its objective form as fulfilment of tendency—is its begging of the value element. This is in principle the argument against all deduction of value from factual categories, either psychological or ontological, and therefore for the indefinability of value.¹⁴ In both cases it is really assumed that fulfilment is better than non-fulfilment. In the subjective form fulfilment of interest equals good, either because it is a special case under this more general proposition, or because there is intrinsic value in pleasure as the sign of fulfilment of a specific tendency or interest. In the objective form, we must either assume this proposition as axiomatic, or else recognize that such a definition as Sheldon’s really defines merely extrinsic values, and that intrinsic value is to be found in some groundless pronouncement of the better or worse of the tendencies themselves. These definitions are supposed to be empirical, but they already presuppose an *a priori* value concept without which the definitions would be meaningless. This *a priori* element we must consider later. But it is already clear, at least, that the value notion “better than” can not be defined in terms of any non-value relation.

III

Let us now turn to the second conception of value—that which holds it to be an intrinsic *quality* of objects. This view, though the primitive and natural, ordinarily gives way to the relational and reappears in a modified form only as a result of the logical difficulties in the latter. It is represented most conspicuously by Russell

¹⁴ But here I must guard against a misunderstanding. The denial that value can ultimately be defined as a relation does not mean that relational definitions are not useful. The position taken here is wholly consistent with that maintained in my *Valuation*, etc., in which I *seem* to define value as affective volitional meaning, and in terms of its relation to interest. But I will recall that I was concerned with the definition and analysis of the consciousness of value, and explicitly said I gave the psychological equivalents of value, value itself being, as I have held there and elsewhere, ultimately indefinable. There is, I still maintain, no science of values except that built on psychological analysis, but there is also the axiological and philosophical problem of value.

and Moore and by Meinong in his later position. Meinong is unique in attempting to combine a psychological and relational definition with a conception of values as qualities. It is, however, a question whether this position can be maintained. If values are really qualities of objects, then they are ultimately not matters of interest at all, but qualities of objects for which feeling furnishes the requisite sensibility. On such a view values subsist just as squareness subsists and an emotional subject is in no way necessary to them.

In considering this view we must at the very outset note a certain confusion as to what is referred to when we speak of value as a quality of objects. On the one hand, by values is often understood such qualities as the good and the bad, the beautiful and the ugly, the pleasant and unpleasant, etc. They are qualities like yellow, hard, loud, etc. On the other hand, the value quale is characterized, often by the same authors (Russell, Meinong), as that which "ought to be on its own account" or "as worthiness to be, or to be of interest." It is clear that there is an important difference between these two statements of the conception.

This difference is so important for all that follows that it must be made wholly clear. It involves, if I mistake not, an equivocation not unlike that involved in the narrower and broader uses of the term value. Here the confusion arises in the use of the expressions value and values. When we speak of *values* we mean such qualities as the pleasant, the beautiful, the good, etc. When, however, we use the expression *value*, it is not necessarily merely as a general term for these qualities; it may also refer to the proposition that the object ought to be, to *something judged because of these qualities*. The same ambiguity appears in the term good itself. It is often asked, why all this modern talk about value when the old-fashioned term, the good, will do just as well? To which the obvious answer is, that value includes more than the good and that the good itself, in the narrower economic and ethical sense, is in turn subject to evaluation.¹⁵

Now to the point in question. I hold that the two are not identical. It is one thing to feel the goodness, beauty, pleasantness of a thing; it is quite another thing to judge that the object ought to be, or ought to be so and so. Because they are usually simultaneous in experience does not mean that they are inseparable for analysis. An illustration will serve to make this point clear.

Von Hartmann has a striking passage that runs somewhat as follows: "The beauty-value of the world abstracts from all reality in that it is concerned wholly with esthetic appearance. From the

¹⁵ This point is brought out by Bosanquet, "The Principle of Individuality and Value," and by Dürr in his "Grundzüge der Ethik."

positive character of this value it follows, no more than from the world's value for knowledge, that also as reality, as a sum of objective real things, it has a positive value. Suppose the world were a paragon of evil, a miscarriage, or a hell, it would still be a value for knowledge, and for the artist beautiful even though this were merely that the painter might study the light of this hell or the poet sing the pains of the damned."¹⁶ I am not concerned here with the truth of the philosophy which underlies this passage, but merely with the important and necessary distinction between the so-called value qualities and value in the sense of the proposition that an object ought to be or to be so and so. With the writer I hold that, from the presence of these qualities, beauty, knowledge-value, etc., *the positive value of the object itself does not follow*. Because the hell is interesting or beautiful, it does not follow that it ought to be or ought to be so. It is perfectly possible for an object to have certain (value) qualities and yet as an object have negative value. As an object may have its full quota of qualities and the question of its existence or non-existence still be left open, so an object may have its full quota of qualities, including its so-called value qualities, and we may still have to ask whether it ought to be or not.

To return then to our point. In considering the conception of value as a quality, we must distinguish between the two formulations of the concept, between value as identified with these qualities and value as made equivalent to the proposition that an object ought to be on its own account. Let us examine the first view. It has been variously stated by different types of thinkers.

The reality of values it has been said¹⁷ stands or falls with the reality of qualities. Values are tertiary qualities and if you strip off these there is no reason why you should stop at the secondary or primary. "The heavens," it is said,¹⁸ "are blue in no other sense than that in which they are beautiful; the difference lies merely in the nature of the subjective content by means of which they are apprehended. It is merely the lower efficiency of feeling, and not any difference in principle, that prevents us from seeing that in the two propositions, the temperature is high and the temperature is pleasant, we have really the same type of predication."

Against this view which, in its more consistent realistic form, makes values subsistents just as redness or squareness, an emotional subject being in no way necessary for them, the argument usually brought is the flat denial of similarity in principle between these so-called tertiary and other qualities. Perry, for instance,

¹⁶ "Grundriss der Axiologie," *System der Philosophie*, Bd. V., p. 8.

¹⁷ Pragmatism, for instance, as represented by Dewey, this JOURNAL, Vol. 10, p. 269.

¹⁸ Meinong, "Für die Psychologie," etc., p. 12.

rehearses this argument in his recent paper.¹⁹ Briefly stated, "the attentive effort at localization, whereas it unites the secondary qualities with the object, dissociates the alleged 'tertiary qualities' and tends to unite them with the sentient." But the qualities chosen by Perry are singularly inept. "A coveted book, a dull day, a boresome meeting, a tiresome place, a hopeful situation"—all these adjectives have so definite a reference to modes of the organism that it seems curious that he should have labored the point at all. If he had gone on with further questions,—Why is the book coveted? Is it worthy of being coveted? A tiresome place; Why is it tiresome? Ought it to be tiresome?—he might have been led to qualities not so easily separable from the objects.

I do not consider, then, that *this* argument against value as an intrinsic quality of objects—in favor of the reduction of it to a relation of the object to a mode of the sentient organism—is conclusive. Certainly a much stronger case can be made out for the objectivity of the tertiary qualities than that against which criticism is usually directed, as an examination of the arguments of Landmann-Kalischer and Meinong would show.²⁰ But I will not pursue the point further, for it does not seem to me to be the fundamental difficulty with the conception of value as a quality. I too hold that value is not a quality of objects, but my objection to the conception cuts much deeper and holds independently of this question of tertiary qualities,—whether they are subjective or objective. It consists *in the denial of the identity of value with these qualities, überhaupt*. In other and more technical terms, value is not a "what" at all, either quality or relation. It is a "that."

I have already noted the conflict of opinion on this point. On the one hand, it is said that "value is part of the complex set of experiences that make up the thing." On the other hand, it is said with equal insistence that "value is never part of the nature of anything." To me the latter seems to be the true position. Just as it is perfectly possible to assume a world with all its qualities, details, and laws, and then still have to ask whether it exists or not, so we may still have to ask whether it has value or not. In the case of our imagined hell, for instance, it may have its full quota of qualities, including its beauty for the artist or its truth for the scientist (that which indeed in one of the ambiguous uses of the word value we may call its beauty *values*, or truth *values*), and yet we may say that it ought not to be—that it has negative value. The "what" and the "that" remain distinct.

But this does not dispose of the doctrine of value as a quality.

¹⁹ Perry, *op. cit.*, p. 153.

²⁰ Meinong, *op. cit.*

There is still the second form of the theory. Let us distinguish between value and the valuable qualities, between the pleasantness, utility, beauty, etc. (whether these qualities be conceived as subjectively determined or not), and the proposition that the object ought to be or ought to be so and so; can we not still call the latter a *quale* of certain objects?

It is true that Russell, who interprets the value predicate in this sense as equivalent to "that which ought to be on its own account," also insists upon the nature of value as a *quale*. But there seems to be an essential contradiction in such a view. Croce has exposed this contradiction in a telling form.²¹ Take, he says, the value-judgment in its usual form, A is as it should be, or negatively, A is as it should not be. The first, he holds, is tautology, the second a logical absurdity. If A exists, it is already as it should be, for it can not be other than it is. From these facts Croce draws the inference that the so-called value-judgment is not a judgment at all, but a mere expression of feeling. Now, as I shall seek to show later, in considering the question of a specific value-judgment, I do not think that this inference is justified, but it is certainly true that the criticism holds *if value is a quale*. Qualities inhere in objects, since it is the quality that makes the object precisely what it is; the judgment of quality presupposes that the thing is not other than it is. But the object may have its full quota of qualities without being judged valuable any more than existent. Make value equivalent to "*ought to be*" and call this oughtness a quality of being, and the contradiction is complete.

We may conclude, then, I think, that value is not a quality as conceived in either form of statement. Such qualities as the so-called tertiary may be, as the realists maintain, as objective as red or warm or sour, and through them we may apprehend *that an object is valuable*, just as through red, or warm, and sour I apprehend an existent object. But the apprehension of these "tertiary" qualities is no more apprehension of the fact that the object ought to be than the apprehension of red, warm, etc., is the apprehension of the fact that the object is.

It is one thing to feel these qualities, the good, the noble, the beautiful, etc. It is another thing to judge "that the object ought to be so," that it is "worthy to be so felt." The latter is the value, the former, the qualities felt or desired, merely the "aspects" of the object through which the value is apprehended, or because of which the object is valued. Value is then not an adjectival predicate, but an attributive predicate. Because a thing is called valuable it has

²¹ B. Croce, "Über die so-geannten Werturteile," *Logos*, 1911, Vol. I., p. 71.

no new quality; it is precisely because of its qualities that it is valued. Its "what" is raised into the sphere of value just as it might be into the sphere of existence. It is a predicate only in the sense that existence and truth are predicates.

IV

We have now examined the two attempts to define value characteristic of the "narrower" view. To the question, is value a quality or a relation, we may unhesitatingly answer: ultimately *neither*! Definition in terms of relation, whether in its subjective or objective form, is impossible without presupposing the very thing to be defined. To conceive value as a quality, on the other hand, means either a confusion of value with the qualities valued, or tautology and absurdity. The importance of this negative conclusion for our general problem is already evident. For, in assuming that value is a quality of being or a relation between existents, value is already subsumed under being. The answer to the question of its relation to reality is already predetermined.

What then is value? Is it definable at all? Does not our conclusion that it is ultimately neither quality nor relation mean that it is indefinable? Strictly speaking, yes. For the "broader" conception, as we have seen, "value admits of further definition no more than being. Now, without accepting all the implications of the broader view, we may at least recognize that value is an indefinable like existence. The value predicate, like the existential, corresponds to a notion that we can understand, but not to a concept that we can define. If, therefore, not strictly definable in the categories of the matter of fact, the value predicate may still be so characterized as to show its nature and its relation to being and non-being, our ultimate problem. To this task we must now turn.

3

There is, we have seen, a third form of the value judgment (A is a value) which gives rise to its own characteristic conception of value, the substantive. It is not uncommon to speak of this or that value as existing (this value is or exists). Value judgments are given the appearance of existential. Ordinarily such judgments can be further analyzed, and on analysis become simply the proposition that such and such an *object*, having value, exists. To speak of value as a substantive is, therefore, held to be an unwarranted hypostatization of qualities or relations into entities. But this explanation scarcely accounts, I think, for this form of the value judgment and the substantialization it implies. Back of the tendency lies a conception of value as a unique and independent category, a recognition of the fact that, as we have already seen, the value predicate is not adjectival, but attributive. It adds no new quality to the object (it

is indeed because of its qualities or relations that it is valued); by this predicate its "what" is raised into the sphere of value, as by the existential judgment it is raised into the sphere of existence.

Now there is, as any one familiar with the subject will know, a view of value which finds it to be just such an ultimate category. For this view it is hard to find a name. One finds it with varied philosophical shadings in the most varied philosophical quarters. If, however, we make use of the now widely recognized distinction between *object* and *objective*, we may perhaps call it the theory of value as an objective, or specific form of objectivity. The name itself is unimportant, but it will be found useful, I think, in distinguishing this view from other possible conceptions.

For the characterization of this view three points are sufficient: (1) Value is ultimately indefinable in the terms or categories of matter of fact—as object, or quality, or relation; (2) the judgment of intrinsic value, that an object ought to be, or to be so and so, on its own account apprehends an ultimate and irreducible aspect of objects; (3) this value is itself not a quale of some objects, but is a form of objectivity, in contrast with being and existence. "Over against the the world of *mere* objects as such are the categories of being and value, all-inclusive categories of the world." On these simple but fundamental points we find a number of students of value in agreement.²² It is true what seems to be a serious point of divergence immediately appears. For some, value is that which ought to *be*; for others, that which ought to *be acknowledged*. But for our present point the difference is not serious. The former is, I think, more ultimate than the latter, and, as will appear in the sequel, implied by it.

To some such conception of value all thoroughgoing reflection must, I think, ultimately be led. On the basis of these three points let us now seek to develop the theory of the value-objective. Our negative conclusions—that value is neither a thing, a quality, nor a relation—creates a strong presumption in its favor, but there are also positive reasons. I will content myself here with but two points.

Our first point consists in emphasizing the verbal form of the

²² Thus thinkers differing as widely as Simmel and Baldwin, Rickert and Cohen. For Simmel ("Philosophie des Geldes" and "Einleitung in die Philosophie") existence and value (*das Sollen*) are ultimate and all-inclusive categories of the world of objects as such. For Baldwin, the "presupposition of existence" and the "postulate of value" are *coordinate* forms of objectivity that emerge in the genetic progression of experience. Cohen and others seek to give this objectivity a name—to characterize it in fact as a type of being. Cohen describes it as "a type of being, the nature of which is to be for will," Marbe calls it "imperative existence." On the other hand, Rickert, and those of similar views, while insisting upon the unique objectivity of value, also insists that it is neither a determination of being nor a form of being. Values are not, but are merely *valid*.

"value judgment." The notion of intrinsic value, as all attempts to render it have shown, can be expressed only in the propositions *that* the object ought to be or ought to be so and so on its own account (or what amounts to the same thing is worthy to be, or to be so and so on its own account). Such phrases do not define value, as we have seen. For one who has not felt it it is as little definable as existence and truth; it can be understood only by relating it to being and non-being. In the value judgment we apprehend a "that," not a "what."

But it may be asked: Can *oughtness* be applied to objects at all? Can we say of objects that they ought to be? Kant, for instance, insisted that for objects, things, there could be no *Sollen* for they simply *are* and have no ear for an imperative. But certainly there is a misunderstanding here. Of many things we can say that they ought to be, when it would be wholly absurd to think that this notion involved a command to any person or group of persons. Even of things that have already happened, of the necessity of which we do not doubt, we may say that they should have been otherwise. *The imperative is but a special case of the category "ought to be" or perhaps even better, a means by which value or oughtness is realized or carried over into reality.*

In the value judgment, then, we apprehend a "that"—*that an object ought to be*. Now, as is well known, it is just this "that," this *dass construction*, which for Meinong, to whom we owe the empirical distinction between objects and objectives, is the sign of an objective. Thus the analysis of any existential judgment (*e. g.*, that the prisoner committed the offense) leads to a clear-cut distinction between the object upon which the judgment is passed, in this case the prisoner, and that which is judged about him, that he did commit the offense. As has been pointed out, the distinction is particularly clear in the case of true negative existential judgments. Suppose I say, "no disturbance of the peace has taken place," and suppose that statement is true. Now every true statement gives us knowledge of something. But what is the something known in this judgment? It might be said that we are given knowledge of the disturbance of the peace. But can we say that the judgment gives us knowledge of the disturbance of the peace when the intention of the judgment is to deny that such a disturbance has taken place at all? That of which the judgment gives us knowledge is that no disturbance of the peace has taken place, an objective.

The usefulness as well as the validity of this distinction will, I think, not be seriously contested. Is it applicable to the value judgment also? ²³

²³ Throughout this discussion the fact of a distinctive value judgment is assumed. The objections to this view will be met in the next article.

It is clear, I think, that here also a similar distinction must be made. Take the form to which every judgment of intrinsic value may be reduced. *A* ought to be on its own account, or *A* is as it ought to be. Of what does such a judgment give me knowledge? Of the object *A*? Certainly not, for in many cases at least it is implied in the very judgment itself that the object is not known. If I say that perfect happiness is a good or ought to be, not only is the object not known, but it is not known whether it is possible or not. Perhaps then the judgment gives me knowledge of a quality of some objects, the quality of oughtness. But we have already seen the contradictions that ensue when oughtness is conceived as a quality. Even more important is the recognition that it gives me knowledge, not of a "what," but of a "that," a unique relation of the object to being and non-being.

Well, then, may we not say that the value judgment in so far as it is judgmental, in so far as it gives me *any knowledge at all*, gives me knowledge of existence or non-existence? The presence of the verb to be in the value-judgment indicates, it is true, that an objective is in some way implied or apprehended. This is Meinong's position when he says that it is objectives, not objects, that are valued. I desire not the object, but *that* the object shall exist or not exist. I value not the object, but *the fact that* the object exists or does not exist. Croce, in criticizing this concept of the value-judgment, says, "that an existential judgment is presupposed in so-called value judgments is beyond doubt, but one must not confuse the condition with the conditioned." Now it may be that knowledge of being and non-being is implied in the value judgment, but it is certain that this is not what the judgment itself gives me knowledge of. I agree with Croce that we must not confuse the condition with the conditioned. My point, in fact, is this: without a relation of "ought to be" (the equivalent of intrinsic value) with being and non-being, value can not indeed be understood, but in order to know that an object ought to be or is as it ought to be, it is not necessary to know whether the object is or is not. The apprehension of intrinsic value is independent of the apprehension of the existence or non-existence of the object.

Let me illustrate. I can very well say that an object ought to be, or is as it ought to be, whether it actually exists or does not exist. There is tautology or contradiction here only if we think of value as a quality. Of things that have happened we may say that they should not have been, although desire and wish are futile. Of objects that are not, it is not meaningless to say that they ought or ought not to be, even when it is not yet known whether they will exist or not. But we may go further. I hold that intrinsic value

is equally applicable to objects of which it is not known whether they *can* exist or not. Of perfect happiness or perfect justice we may conceivably know that they ought to be when it is not known whether they are possible or not. I am inclined to believe also that not even the subsistence of an object is necessary to its value, but this point I shall leave for a later part of the discussion.

It is then not being or non-being that the value-judgment as such gives me knowledge of, but of something wholly different, that an object ought to be or ought not to be. The inference from this is obvious. Always remembering that valuation is judgmental, that it *does* give me knowledge of something; and remembering, secondly, that it is neither a relation of object to subject nor a quality of the object, we seem forced to conclude that it is a unique and independent objective. Value does not *presuppose* an objective, but is an objective. Between these two statements the difference is all-important.

V

This somewhat technical argument has been, perhaps, unduly extended, but it seemed necessary, not only for our present point, but for its bearings upon later positions. If, however, the argument is sound the consequences are of considerable importance. All attempts to determine the relation of value to reality start with some definition of value—either as a unique quality or a relation, as some determination of being. It follows that if these conceptions are unsound the theories based upon them must fall. On the other hand, if value is a wholly unique and irreducible form of objectivity, lying between being and non-being, but itself not a form of being, the problem of the relation of value to reality takes on a new form.

What this relation is, is yet to be determined. The conclusion of importance here is that value is not a form of being. It is, to be sure, extremely difficult to hold fast to this conception of value as pure, as a unique form of objectivity, containing no element of being. It is contrary to our ordinary ways of thinking. As we find reality intolerable without raising it to the sphere of value, so we find it equally difficult to think value without reducing it to some form of being. Out of this way of thinking arise all the confusions which furnished the starting-point of our study and the consideration of which will occupy us in the sequel.

There have been many attempts to give this unique objective a name, to reduce it to some form of being. Thus Marbe speaks of value as "imperative existence," Cohen describes it as a unique form of being, "being for will." In these attempts to do justice to the nature of value as ultimately an objective, and at the same time to recognize its relation to an emotional subject that can not be elimi-

nated, certain problems are indicated which still remain to be solved. But this at least may be said. We must hold fast to our conclusion that value is neither a determination of being nor a form of being. Existence for a subject, being for will, remain "pseudo existence." The feeling of value exists, the relation between the value and the emotional subject subsists, but value itself, if we must have a term, is merely "valid." On the other hand, it seems equally fatal to interpret the objectivity of value by recourse to an over-individual subject or will. We are then back in the difficulties of the relational definition. Rickert complains that Münsterberg in deducing value from an over-individual will does not wholly escape "psychologism," and the claim is, I think, well-founded. But it is not certain that the criticism does not affect his own position also. For over-individual obligation is either a term like round squares, or else it is a relation between an existent self and an object. You can not lift the relation of obligation out of the sphere of existence merely by calling it over-individual, nor can you transcend psychology merely by prefixing to it the name transcendental. It seems better frankly to recognize value as a unique objective not reducible to being in any form. How it is related to being and reality is a problem we have yet to attempt to solve.

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FACT, DEFINITION, AND CHOICE

TO err is human, but nature is above deceit. Let the issue then be tried out in practise; whenever one has a matter to verify let it be put to the test of experiment. This has always seemed sound method so often as man, wearied with seeking truth in the innermost self, has turned to put his questions to the world about him. Too long has man's mind played the sphinx, says this faith. Interrogate a deity which can not play you false, which can be called upon to answer every riddle which concerns itself. Wise is he who knows how to turn the lofty unconcern of nature to satisfy his human cravings.

But is there, after all, as some would say, a type of judgment that can never be made an experimental issue? The wisdom which counsels us to bow to nature's hard inflexibility is not the wisdom which concerns us here. Is there any class of facts which can never take us unawares? Are there cases where the issue of experience can never yield the unexpected?

The chasm between nature and man's will does not yawn quite so wide when one has understood that facts are not as rigid as they

seem. The gap is further bridged when one has come to know that the will to understand the world no less than nature may set at nought our wishes. A science well enough may fail to shed light on the dilemma which was the first source of its systematic dress. The bright spark cast off from the wheel of life and born to illuminate some dark corner of the world may easily light up some other unsuspected nook. The genial insight, the discovery which marks an epoch, a simplification in the scheme of things, that yields man transient satisfaction, may be the result of conscious groping in quite another direction. The will obeys its self-imposed limitations as nature obeys her laws. Has nature her surprises, the will has its caprice. If a gulf be fixed between the facts which man discovers and those which man invents, the clue to its character will not be lurking here.

The problem may be stated in a variety of ways. Whatever has been read into the context of experience *überhaupt* will turn up again as an element of separate experiences. In such instances we like to say that we have only *discovered* such and such a trait of experience because we have managed to *invent* it beforehand. It is notorious how often we are put to it to say whether the outcome of an experiment yields a novelty or only serves to illustrate a definition. This doubt is felt by those, for example, whose habit of thought it is to contrast that series of points, which exhausts the mathematical continuum with that other series of points, which, they say, goes to make up the physical continuum. It is not the fear that the experience of continuous space may some day furnish us a "surprise" point, which has no analogue in the number series, that introduces this distinction—as the arrow-point moves back and forth over the scale each reading is a point in the mathematical series. The physical continuum is assumed as a sort of reservoir of potential points and it is so assumed in order that each new type of point interpolated in the mathematical series shall be guaranteed an application to the space of "reality." If now it turns out that only three point-types result from our definitions of number, the potential points of the physical continuum are all real and the distinction between the mathematical and physical has disappeared. Surely here is a case where experience can never take us unawares; and yet this ghostlike reservoir of potentialities continues to haunt the thought of not a few of us.

In throwing a die we predict that the frequency of each event will even up in the long run. But this prediction can neither be confirmed nor rejected by experience. If each event occurs n times in $6n$ trials, the truth is only served *per accidens*. If n be large and n trials yield the same result we speak of a run of luck. No matter what the outcome the experimenter never will be forced to modify the law; he will always lay the fault to his experiment, for he is concerned

with a matter of definition. If you were to ask him to name the ideal conditions for his experiment's success, he ought to say: those conditions which tend to confirm the law; a die is a good die if the frequency of the different events approaches equality.

Are there judgments of fact whose truth can not be made an experimental issue? This is a question which has always had an important bearing on the meaning of definition. The answer that has been given to it has often decided for a philosopher what his understanding of definition and choice must come to be. The relationship between this question and the meaning of choice has proven to be intimate because a philosophy which does not take freedom into account could never make us understand how knowledge comes about at all.

The choice of an hypothesis which explains established facts and which we must be prepared to give up in the light of a richer experience is a familiar instance of the exercise of freedom. We place our faith in the dogma that fuller knowledge will tend more and more to compromise a false hypothesis while it renders a truer one more workable. This dogma is a matter of definition, for this is what we mean by truth. Such a choice is the fruit of ignorance and may cease to be a choice as soon as observation is carried far enough. An hypothesis, which is based on an induction of known facts and which could outlive any experience, however rich, would be an absolute too thinly veiled to tempt any but the most untutored impulse to belief.

Freedom itself seems at first sight a fact which can never be made to bow to the issue of experiment. Might not ignorance be so far entrenched, might not the balance be so delicately set that the most fleeting force would turn the scales and decide the choice? It was for that passing force that the ass of Buridan must have prayed when he faced starvation because nothing could *just* happen and without any cause. Can experience decide for or against the "law of the reason"? The materialist will answer no and he will add that it is because we can never know enough about the conditions that are involved. Others, answering no, would say that it is because an experience from which ignorance has been completely banished could not be experienced at all—that one can not know unless he can come to know better.

Descartes brought a novel conception to bear upon the problem. His instinct told him that mechanism must not be so conceived that it leaves no room for choice. Unsatisfying as his answer was, even in his own day, it yet served to keep alive the difficulty. The law of the reason holds without restriction save at one exceptional point. The soul seated in the pineal gland looks out upon a universe for which God legislates, upon which God has stamped the necessity of

the mechanical order, and from his vantage-point this soul time to time effect changes in a nature in other respect ordered. For Descartes's follower, Spinoza, man's freedom only blemish in a perfection otherwise complete. Just as may show a discontinuity where the axioms that determine geometry do not hold, so does this soul of Descartes enjoy freedom from the chain of matter. Its freedom is guaranteed by continuity in the mechanical order. It is the only loose joint in a system of rigid connections that joins axiom with theorem. The intelligible this new conception was the task of Descartes and his successors. Its originality compelled attention in a later day when mechanism was achieving some of its most brilliant triumphs. A desire for the continuity of mechanical explanation more sorely tempted men to give it up.

Kant, too, saw that choice must not be entirely arbitrary but must always take certain restrictions into account. The stages of his thought represent these restrictions as absolute, though he was untrue to his earlier point of view, which crowds out of experience altogether, and it is to his infidelity that we owe his deeper insight. But apart from the fact that the Cartesian manner of understanding human choice was seemingly for a long time outworn and repudiated by its consequences, it never contained a certain germ of truth which may well have determined the meaning which Kant put into his doctrine of choice. As he is said, the supersensible world is only a discontinuity in nature, a loose joint where freedom finds a certain play. That self which is seated in the pineal gland, which is *in* the world, but not *of* it, is not so different from that other self seated in the noumenal world of appearances. Was it not natural for Kant to declare that the law which legislates for nature is somehow exempt from the mechanical order which it reads into the world?

To every student who has carried his studies no farther than Euclid, geometry must seem the very embodiment of a necessity which leaves no room for choice. Here is truth absolute from which error has been forever banished—or if the caprice of accident finds expression at all it must be sought in the application of the science to the freedom to relate this universal truth to any particular case please. This conviction is a normal one. It was shared by every mathematician up to the beginning of the nineteenth century. In geometry, and astronomy were the flower of the Greeks' scientific bequest to man. Such was the spell which these triumphs of the Greek mind cast upon modern thought that for two millennia no one had ventured to imagine that here there lurked any opportunity for freedom to find expression. The first emancipation from this

came in astronomy. Copernicus showed that the Ptolemaic system was not the only way to describe the motion of the heavenly bodies. He demonstrated the possibility of a non-Ptolemaic astronomy and pointed out that the new view had an advantage over the old in the ease with which it could be applied to the prediction of celestial events. He intimated that the selection of a point of rest in the cosmos is arbitrary and a matter of choice. Geometry had to wait longer for its Gauss and biology harbored the belief in the Platonic doctrine of fixed types until the time of Darwin. The world is still waiting to be freed from the chains forged by the genius of Aristotle. The possibility of a similar choice has not yet revealed itself in the case of logic.

Such episodes as these illustrate Kant's insight into the meaning of choice. Human freedom can only be understood in the light of its history. It is knowledge that "*allmählich*" and not "*einmalig*." Not a reason independent of the will is the guide that fashions and controls belief, but the will acting under its self-imposed restrictions. Kant was the mind that was the first to see this clearly. He saw that freedom is no gift which God has conferred on all men alike, a property as it were of our common humanity. No man is free till wisdom guide his choice. A valid choice is not alone a creative act. It is only brought about by a will that has long been tempted by debate, that has long been schooled by a dialectic experience not all its own creation, but in larger part bequeathed by the past. The consequences of a decision must be clear before that decision may become a conscious choice. To bring these consequences into the light may cost the genius of centuries. The denial of the fifth postulate of Euclid could never have succeeded until it was foreseen that two more fundamental sciences, logic and arithmetic, could not be affected by the choice of another assumption. The emancipation was brought about slowly, the point of attack beginning where the Euclidean system was weakest, that is to say, with the difficulties surrounding the notion of parallels. When it was seen that the consequences of denying the parallel axiom could have no bearing on the other axioms or on logic, nothing could prevent Gauss's important step being taken. The nature of the space we live in has turned out to be a matter of definition. Thus one can point to a few brilliant episodes in the history of thought to illustrate his meaning when he says that man's freedom is realized gradually as the result of many struggles—struggles requiring at times long periods of silent preparation to achieve their triumph. A science can not commit itself to the consequences of a choice until it has come by the wisdom to foresee the effect this choice will have upon its cognate disciplines, and this wisdom is the fruit of a schooling which no one mind may enjoy until it has become the inheritance of mankind at large.

Necessity and universality were the two characteristics which Kant was fond of pointing to as marking the essence of an *a priori* judgment. Will we do violence to his thought if we put his formula in another way? Can the outcome of the experiment be predicted before the experiment is made? and, can any experiment be imagined which would force us to revise our prediction? If the matter were put so our criterion would border perilously on the subjective. What meaning then are we to find in the *a priori* of Kant and still leave a place for Kantian freedom? This brings us to our conclusion. An *a priori* judgment is one whose truth can not be made an experimental issue. Here there is standing-room for absolutist and humanist alike. Their quarrel will hinge upon what one means when he speaks of the impossibility of empirical verification. A philosophy which conceives truth as if it were a static whole will be apt to make this impossibility absolute. But a philosopher, who views the world dynamically, will find that the denotation of this class of judgment is contingent on a thousand issues, each one relative to itself and to the others.

HENRY BRADFORD SMITH.

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REVIEWS AND ABSTRACTS OF LITERATURE

Behavior: An Introduction to Comparative Psychology. J. B. WATSON.
New York: Henry Holt and Company. 1914. Pp. xii + 439.

The traditional view that psychology is the science of consciousness, or the more extreme view that it has only to do with "clear consciousness," has been found to be inadequate by numerous persons who have a practical interest in human beings and, as they think, in human minds. Neither education, industry, business, nor medicine finds much of concrete value in the psychology of a recondite awareness available only to its possessor. All of these practical disciplines have, therefore, insisted on a new statement of mental facts, a statement which deals with the phenomena of mental life as objective facts of the same general sort as those with which the anatomist and physiologist have to deal. Memory must be as open to objective study as is circulation, and the mechanisms of association no more inscrutable than the mechanics of digestion.

The revolt of educational, medical, and other forms of applied psychology has been powerfully strengthened in recent years by the growing interest in animal psychology which also could not exist if psychology were only about consciousness and its only method that of introspection. Professor Watson's book on "Behavior" presents the case of the revolt from the animal psychologist's point of view. It is virtually a declaration of independence with a statement of the reasons therefor.

In the opening chapter on psychology and behavior, the author attempts to show that "human psychology has failed to make good its claim as a natural science." He defines psychology as a "purely objective experimental branch of natural science," and draws certain conclusions as to elimination of certain "pseudo-problems" from the realm of psychological discussion. The image he finds to be admittedly nothing more than a centrally aroused process and then contends that "there are no centrally aroused processes" (p. 18). "They are probably in most cases kinesthetic substitutes for imagery" (p. 18). Affection is brought under the behaviorist's programme by being definitely connected with the sex organs and erogenous zones.

Chapter II. gives an overview of the field of behavior under the following heads: (I.) Sense organ functions; (II.) instinctive functions; (III.) habit formations; (IV.) correlation. Then follows a discussion in Chapter III. of apparatus and methods of study. Here is brought together material from widely scattered sources upon ways of studying animal problems. Illustrations of apparatus are shown and details of method are discussed. Chapters IV. and V. review the literature on instinct and related activities and give the current biological account of the origin of inherited behavior.

The mid-portion of the book, Chapters VI. to X., deals with problems in habit formation. The author, in common with other writers, reduces all behavior to two classes—instinct and habit.

Instinct is "a combination of congenital responses unfolding serially under appropriate stimulation . . . a series of concatenated reflexes," the pattern and order being of "a strictly heritable character." Habit differs from instinct only in the fact that "the pattern (number and localization of simple reflex arcs involved) and the *order* (temporal relations) are "acquired during the lifetime of the individual animal." The most difficult problem which this conception sets is that of showing how "concatenated reflexes" of "a strictly heritable character" can be altered in pattern and order. For this resolution of inherited behavior into new patterns and orders, Watson relies upon "the principle of frequency" and "the principle of recency," and rejects Thorndike's idea of the "law of effect" with its corollaries of "satisfiers and annoyers."

The author's argument, although backed up by a somewhat ingenious symbolism, is not convincing. He develops the theory with motor habits and in doing so neglects to deal with the whole chain of reflexes which have their origin in a sensory situation. An "inherited series" of "concatenated reflexes" initiated by a sensory stimulation do not change their order of functioning except when the exciting situation is altered, *i. e.*, if the sequence of acts is S, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 at one time, and at another is S, 2, 3, 4, 5, 6, 7, 8, 9, 10, and at another is S-13-14-15-10, it is not by accident that the sequence varies. Either the environing situation has altered or the metabolic processes in the organism have changed or the activity of the organism has produced changes in itself. With the situation remaining constant, the metabolic processes remaining constant and the animal active, it would seem that the latter is the de-

termining factor. Just how the effect is produced may not be clear. That, of course, is the thing to be explained, and Mr. Watson does not escape responsibility for such explanation by ignoring the problem.

The four chapters at the close of the book detail the results of experimental studies in vision, hearing, and other sensory functions, and it is probably in these chapters that the author is most acceptable. His intimate knowledge of experimental method and literature, and freedom from controversy, give these chapters a quality not found in the other portions of the book. In his discussion of the work on higher animals he is far from satisfactory either in his report of experimental work or in his interpretation. Out of a little more than five pages devoted to imitation in primates, two and a half are given to the discussion of his own pseudo-experiments on monkeys. The reason for this is apparently the author's unwillingness to accept the idea that animals learn by imitation. The right to insist upon his doctrine is, of course, admitted, but to telescope and misstate the work of other experimentalists in so doing is to forsake the rôle of scientist for that of the advocate.

On the side of presenting and interpreting details of behavior, Professor Watson's book will prove much more acceptable than in the extreme statement of the behavior theory which it contains. In the first field it clearly supersedes all other books now available and will doubtless become the accepted text for advanced courses in animal psychology. On its theoretic side, it will fall far short of general acceptance as the author doubtless anticipated it would. There is need of a revision of psychological theory. It is difficult to see how the science can grow if there is not some relief from the logical absurdities of parallelism, privacy of mind, and other impossible presuppositions. Few, however, will go to the extreme of saying that "psychology must discard all reference to consciousness" or that the psychologist is "never to use the terms consciousness, mental states, mind, content, will, imagery, and the like." One may accept the statement that psychology may be written "in terms of stimulus and response, in terms of habit formation, habit integration, and the like," but urge that one of "the responses" to be considered is the knowledge which one gets about his own acts which no one else ever gets, the response of awareness of one's own experiences. Conceivably, these states of awareness might be studied directly through observation of neural activity. To date, there is no hint of the experimental technique for such direct observation. In the absence of such means, it seems the merest folly to refuse consideration of such knowledge as introspection does give. The reviewer is willing to admit that introspective data lack scientific reliability and are in no sense the final data of psychology. That they are experiential facts seems, however, indisputable. It is also perfectly certain that they can be used to guide experimentation, and in this capacity they become of great scientific importance. We are hardly, therefore, ready to cast them aside as of no value. They are, at least, as valuable as color discrimination apparatus and other experimental devices.

M. E. HAGGERTY.

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Three Lectures on Esthetic. BERNARD BOSANQUET. London: Macmillan and Company. 1915. Pp. ix + 118.

This is a book to which the present reviewer would gladly be just, but doubts his ability to be so. Mr. Bosanquet has made a most laudable effort to be simple and direct, and simple and direct the result is, somewhat as higher mathematics are. One who has learned to be apprehensive of books about esthetics draws in his pseudopodia when told that the interest in esthetics which the reader is expected to bring is "the interest of a branch of philosophy." Many good things are said, of course, two of which may be quoted: "I confess that all this talk about method in philosophy seems to me rather foolish and wearisome. I only know in philosophy one method; and that is to expand all the relevant facts, taken together, into ideas which approve themselves to thought as exhaustive and self-consistent" (p. 3). And this: "If it is ever true that there is no use disputing about tastes, this is certainly quite false of esthetic pleasures. Nothing is more discussed; and nothing repays discussion better. There is nothing in which education is more necessary, or tells more. To like and dislike rightly is the goal of all culture worth the name" (p. 5).

The discussion or rather explanation is, as a whole, very abstract. Back of it hovers the shade of Kant, and accordingly the topic of the first lecture is the "esthetic attitude." One familiar with Kant quite understands when told that the esthetic attitude is described in the doctrine of the "esthetic semblance"; "Man is not civilized esthetically till he has learned to value the semblance above the reality" (p. 10). More tersely the esthetic attitude is defined as "that of feeling embodied in form." As feeling or something of the mind is embodied or incorporated in an object, and submits thereby to the object's objective laws, the true doctrine is a doctrine of expression; the object, the work of art becomes an expressive thing, not sufficiently described as an object of contemplation. The thing incorporating feeling must be there before feeling or imagination can be articulate or fully self-conscious. Croce is, therefore, wrong in his claim that beauty is already complete in an idea that precedes incorporation. There are different arts because different media (sound and marble) have to be handled so differently as to yield very different results. We are not told that music is the best example of successful art, but the idea that it is so is favorably commented upon (p. 57). The word architecture does not occur in the index, and the reader may have the impression that an art so controlled by objective demands can not be easily brought under an idealistic doctrine of expression.

Ugliness is beauty in the wrong place. "Suppose the beautiful silky ear of a dachshund replacing the ear of a beautiful human face. It would be, I imagine, a horribly hideous thing. Here we have in principle, I think, a genuine case of ugliness" (p. 102).

It is a pity that Mr. Bosanquet did not dwell more upon what he calls "the Home-coming from Fairy-land," the learning, that is, to look about us in the life of our own day for the subject matter of art instead of in the

mysteriously distant and remote. What we have thus come home to and how we are to be at home there is of the very greatest moment. Since the sixties the change has been on the whole, we are told, "to simple vision and humanity." To any sincere and normal audience, this is sure to be, perhaps, the most interesting topic in the entire field.

Mr. Bosanquet closes his third lecture aptly and tastefully with a passage from Goethe's essay on Gothic architecture, telling us that it conveys the message he has been trying to express; and the essence of the passage may be put somewhat as follows. Be not too tender to enjoy significant roughness. Fine art did not arise from the effort to make the world beautiful. Art is formative long before it is beautiful, and yet it is then true and great art, often truer and greater than beautiful art. Art that is characteristic is the only true art.

The book is better and more interesting than this notice suggests, but it is not for those whose interest in the subject is rather in beauty than in "philosophy."

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Personality. F. B. JEVONS. New York: G. P. Putnam's Sons. London: The Knickerbocker Press. 1913. Pp. v + 167.

The argument for the existence and nature of personality advanced in this book presents nothing essentially new in treatment or results. The volume comprises the matter of four lectures given during the summer of 1912 at Oxford in the Vacation Term for Bible Study.

Physical science and psychology do not require the assumption of personality as an abiding unity. An examination of the positions of Hume and James finds that, while these authors deny the existence of a permanent self, their arguments unconsciously involve such an entity. Likewise Bergson's thesis that change alone constitutes reality is discovered in its elaboration to imply a permanent subject of the flux. By way of comment on the above discussion one might remark that the arguments of James and Bergson appear to be directed against a particular conception of the self rather than against the existence of personality. The book concludes with the contention that emphasis must not be concentrated upon the self as the unity of an independent individual. Personality necessitates relation with other individuals and with God, a relation the essence of which is love.

SAVILLA ALICE ELKUS.

SMITH COLLEGE.

JOURNALS AND NEW BOOKS

RIVISTA DI FILOSOFIA. March, 1916. *La Filosofia vagabonda.* (pp. 1-50): ROBERTO ARDIGO. — Positivism is the only true philosophy. It alone gives us certainty, objectivity, and truth. All other systems, such as materialism, spiritualism, idealism, etc., are sophistical and "vagabond." *Il compito della Filosofia nel rinnovamento degli ideali della patria* (pp. 51-66): ANNIBALE PASTORI. — Philosophy is not a study which isolates man from life and from society. Whether it is taken as a conception of nature, or as a conception of mind, it is an essential factor in our modern civilization. *Il valore della vita* (pp. 67-82): G. SALVADORI. — In action, not in mere speculative thought; or rather in an intimate comprehension of action and thought, must we seek the profound secret of life. *Il problema sessuale nell' educazione* (pp. 83-97): N. CENTOLANI. — Sexual instruction is a necessary part of education. Systematic ignorance of the sexual problems has pernicious results. *L'insegnamento della Pedagogia nelle scuole normali* (pp. 98-111): A. MARUCCI. — The teaching of pedagogy in normal schools ought to consist of the following three parts: history of scholastic and prescholastic institutions; history of pedagogical doctrines; general methodology. *Studi critici. Discussion. Recensioni:* Michele Losacco, *Schelling*: P. MARTINETTI. Jacques Chevalier, *La Notion du nécessaire chez Aristote*: A. F. B. Giuliano. *Il valore degli ideali.* Alois Riehl, *Nietzsche.* L. Salvatorelli ed E. Hün, *La Bibbia*: A. GAMBARO. *Notizie. Sommari Riviste.*

Carpenter, Rhys. The Ethics of Euripides. Archives of Philosophy, No. 7. Edited by Frederick J. E. Woodbridge. New York: Columbia University Press. 1916. Pp. 48.

Ito, Sangoro. A Comparison of the Japanese Folk-Song and the Occidental. A Study in the Psychology of Form. University of California Publications in Psychology, Vol. 2, No. 5. 1916. Pp. 277-290.

Miller, Lucius Hopkins. Bergson and Religion. New York: Henry Holt and Company. 1916. Pp. ix + 286. \$1.50.

Stearns, Frank Preston. Politics and Metaphysics. Boston: Richard G. Badger. 1915. Pp. 186. \$1.50.

Vanderbyl, Henry Rosch. Challenging a God. Boston: Sherman, French, and Company. 1915. Pp. 150. \$1.00.

NOTES AND NEWS

AN important ethnological expedition is about to be undertaken by Dr. R. H. Lowie, of the American Museum of Natural History. He will visit, first, the Crow Reservation in southern Montana, where he hopes to secure a thorough-going account of the war customs of the tribe and to complete a collection of myths and folk-tales. After spending a short time

with the Arapaho, of Wind River, Wyoming, in order to reexamine their ceremonial organizations, Dr. Lowie will proceed to northern Arizona, where an investigation of certain problems connected with the Hopi will be carried out in considerable detail. The main points of inquiry will be the character and functions of the Hopi medicine-man, and the nature of the religious feelings underlying the ceremonial performances already noted by previous observers.

THE *Revue de Métaphysique et de Morale* makes the following announcement in the May issue: "Étant donné le petit nombre de publications concernant la philosophie, le *Supplément* sera supprimé jusqu'à nouvel ordre. Ce *Supplément* sera repris dès que les circonstances le permettront et il sera rendu compte des quelques ouvrages, fort peu nombreux d'ailleurs, qui ont été adressés ainsi que de ceux qui continueront à parvenir au bureau de la *Revue*."

A PSYCHOLOGICAL laboratory has recently been established at Bellevue Hospital, in New York City, under the direction of Dr. Menas S. Gregory, Chief of the Psychopathic and Alcoholic Services. Facilities will be provided for both clinical and research work. As these services admit about fifteen thousand patients annually, the opportunities for research will be exceptional. Dr. Leta S. Hollingworth, formerly psychologist in the Department of Public Charities in New York City, has been placed in charge of the laboratory.

THE following graduate students of psychology have been appointed as fellows for the coming year in the Bureau of Salesmanship Research affiliated with the Carnegie Institute of Technology: Dwight L. Hoopin-garner, of the University of Texas; C. P. Stone, of the University of Minnesota; Russell L. Gould, of Columbia University; and Edward S. Robinson, of the University of Cincinnati. In addition to these appointments, Dr. Kurt Friedlaender, of San Francisco, has been appointed honorary fellow.

PROFESSOR E. A. KIRKPATRICK, of the State Normal School, Fitchburg, Massachusetts, is giving courses of lectures this summer at the State Normal College, Greeley, Colorado, the State College at Pullman, Washington, and the State University at Eugene, Oregon.

PROFESSOR E. G. SPAULDING, of Princeton University, is giving at the second term of the University of Chicago Summer Session one undergraduate course, Outlines of Philosophy, and a graduate course of Philosophy and Science.

DR. J. CARLETON BELL, for the past four years professor of the art of teaching at the University of Texas, will return to the Brooklyn Training School for Teachers in September.

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

A REVISED CONCEPTION OF CAUSATION AND ITS IMPLICATIONS¹

TO identify causation with sequence is a matter of established practise. Frequently, however, "change" is given as the more distinctive feature of causation. But the passage from "change" to "sequence" is a short step. For when the question is raised: What constitutes the cause or existence of change? the answer invariably follows: the antecedent (or antecedents) that regularly precedes a change is its cause. Thus Mill may be taken as widely representative when he writes that "whether the cause and its effect be necessarily successive or not, the beginning of a phenomenon is what implies a cause, and causation is the law of succession of phenomena";² that is, "the beginning of a phenomenon [change] is what implies a cause," but causation with him, notwithstanding, is a *succession* of phenomena, "whether the cause and its effect be necessarily successive or not." I can not conceive of a passage more full of delicious confusion. But should we, on the other hand, insist that "change" in the form of origination, is not thus adequately explained, then Bradley, following in the spirit of Hume, offers the other common variant on the subject: "We may regard cause as an attempt to account rationally for change. . . . But the endeavor to find a satisfactory reason is fruitless."³ Thus the history of causation is briefly indicated: Causation is either an invariable sequence or it is purely and simply a matter of skepticism. Kant and his descendents, as we shall see, present no exception to this general position. It is not amazing that philosophy, thus pledged in causation to succession, was led only to an evasive or negative conclusion. Rather is it praiseworthy that, thus pledged to a wrong path, philosophy should frankly proclaim that its analysis of causation led to nothing.

¹ Read before the American Philosophical Association, Philadelphia, December, 1915.

² "Logic," page 248; 8th edition.

³ "Appearance and Reality," page 54.

Closely bound up with causation is the attempt to define or, as is more common, to leave undefined, especially in its objective sense, that exceedingly vague and much-abused term, *relation*. What relations *are*, however, constitutes a specific question. Instead of a definition, a mere affirmation or denial of relations is what we frequently encounter. Often it is the fact of *origin* that is confounded with and substituted for a definition of relations. Without a prior definition of relations, however, their classification as internal and external is equally lacking in pith. In defining causation, I shall in a way also define the meaning and reality, such as it is, of relations. But in so doing I shall not attempt within the limits of this paper to state whether relations have an objective meaning and reality apart from causation.

I

In a study of causation, two things must from the outset be kept distinct; namely, causation and uniform recurrence. Causation is one thing and uniform recurrence is another, and we merely invite defeat when we substitute recurrence for the foundation of occurrence. Put thus, their usual identification certainly reflects curious confusion. But a mere statement of the confusion does not carry us very far. What it should do is to apprise us of the necessity to define each of them more fully in its own specific nature. Not until then would it seem permissible on our part to add that they are one and the same thing or two different things. Before subscribing to the error, then, that uniform recurrence is causation,⁴ I would urge that we first inquire into the nature of each.

For, by way of argument, let us assume that causation has its differentia in the fact of sequence. This characterization, however, soon proves its inadequacy. Nor do we improve matters when, in the course of time, we prefix "invariable" to sequence. For the problem that would return is, how to differentiate this form of an invariable sequence from other possible forms of it. Thus time, for example, in its divisions of past, present, and future, involves a sequence no less invariable than that asserted of causation.⁵ Causal sequence, therefore, must involve something more or something different from what it shares in common with other forms of an invariable sequence to justify its status as a distinct phase of human ex-

⁴ How Mill in particular makes all the facts in his extended analysis of causation fit into this formula is interesting reading.

⁵ In this connection, I beg the reader to recall Mill's defense of causation as an invariable sequence against "the objection," as he writes, "very plausibly urged by Dr. Reid, namely, that according to this doctrine night must be the cause of day, and day the cause of night; since these phenomena have invariably succeeded one another from the beginning of the world." "Logic," page 244.

perience. Can we give evidence of this something more or different? Thus pressed, suppose we fall back upon the element of change. But if causation be identified with sequence, the change-aspect of causation, as perceived in the statement of Mill, is sublimated into a mere succession of independent, static units. Hume's own position on the subject is a commonplace: "every effect is distinct from its cause. It could not, therefore, be discovered in the cause." Not to appear niggardly, however, let us admit the element of change. But even with the element of change incorporated, would causation as an invariable sequence differ from, let us again say, time? They would not differ from each other in so far as we affirmed that change in time, as denoted by the terms past, present, and future, was of the same general order as change in causation, denoted by the terms cause and effect. But if we do not establish a difference between them in point of "change" or "succession," we of necessity fail as yet to differentiate causation from time, or time from causation. Yet forthwith to identify them is not justifiable, although at this point such procedure is common; for in the event of their identification, we ought to guard against the use of two terms, apparently so different, for one and the same thing. If, however, in the belief that causation is something distinct, we push our analysis a little further, we would soon see that "change" in causation differs from that of time in three fundamental respects. In the first place, change is not only central to causation, but it is *empirically* determinable, whereas the reality of an actual change in time is rather, like time itself, an inferential existence based upon the reality of some accepted form of an empirical change. Hence, in causation, it is the idea of discontinuity that comes to the front; in "time," it is the idea of continuity. Secondly, a causal change is *empirically conditionable*, whereas a change in time is neither empirical nor empirically conditionable. By the phrase "empirically conditionable," I mean that every specific instance of causation either is, or in the postulate of every science is assumed to be, under the control of a specific number of specific objects⁶ (or things) to the exclusion of others. Thirdly, causation is often reversible, whereas time, for all we know of it, is not reversible. Thus, for example, chemists affirm that every chemical compound is of the reversible type; that is, the effect of a cause may in turn become the cause of the original cause. The fact that *every* instance of causation is not convertible does not affect the conclusion that many instances of causation are convertible, whereas time *never* is. Now convertibility emphatically proves that causation

⁶ I use the word "object" in its loose and general meaning. The problems it involves for causation may, for the present, be entirely discounted.

may work backward as well as forward. In a consideration of convertibility, then, we have to take note of a distinction that is not only radical in its bearing upon any conception of causation itself, but one that is in high degree directly destructive of that wide but erroneous tendency to unite or identify causation with time. Causation is thus distinguished from time by the fact that the former embraces, as essentially vital to it, certain characteristics totally lacking in the latter. Our decisions were attained, however, by abandoning the element of sequence in causation for that of change. The question as to whether sequence is at all relevant to causation will return for discussion under several different forms. Generalizing, we reach the conclusion that a causal situation is distinguished from a non-causal one by the mere presence or absence in a given situation of an empirically determinable change. Holding to the fact, then, that every empirically determinable change is an instance of causation, we may add that some of its additional characteristics are that it is empirically conditionable and often reversible. Other characteristics of causation will be made evident in the course of the discussion. Here, however, we may affirm that a causal occurrence is thus obviously identifiable, and, of necessity, will remain so whether the occurrence is regular or capricious. The fact of a regular or capricious recurrence under similar conditions, would be a second distinct fact. Hence it will fall within the province of this paper, a little later on, to show that regular recurrence, in its aspect of regularity, is an event as distinct and unique in human experience as that of occurrence. Accordingly the question as to whether occurrences regularly repeat themselves constitutes one problem. The question as to the foundation of an occurrence constitutes another. We may answer the first question in one way or another; but the problem of occurrence would not be at all affected by the conclusions reached in respect to recurrence. First, then, let us direct attention to the subject of occurrence.

II

A "cause" in the full meaning of the word is not only an object that precedes an event, called an effect, but it is further assumed to be something from which the effect itself issues forth. Our failure to lay bare the particular principle of our search is to be ascribed to our neglect adequately to analyze a "cause." To begin with, a "cause" never consists of *one* object only, nor, on the other hand, does it consist of *all* existing objects. A limited number of objects represents in every case the specific cause of a specific effect. If this were not true, a change would in large measure forfeit its conditional and empirical character. For in the statement that a given

change is conditioned, the fact of an agency is less frequently implied than the inclusion of certain objects to the exclusion of others. That, out of a vast multitude of objects, we select a specific number of them as the elements of a cause, is a commonplace in logic. The reason we offer is that the origination of an event, however inscrutable, is, notwithstanding, entirely within the control of the specific objects involved. But this so-called inscrutable element should, as I shall take pains to prove, be pushed back two additional steps. Thus, let us accept *A*, *B*, and *C* as the cause of *E*, their effect. By including *A*, *B*, and *C* in the cause we merely invoke a principle that in its turn excludes *D*, *F*, and *G* as elements within this specific cause. Such instruction is the burden of logical methods. But an additional bit of information remains to be added; namely, that *A*, *B*, and *C* may exist without producing the "effect" *E*. Wherein, then, lies the difference between these two manifestations of *A*, *B*, and *C*? My answer is brief. The difference lies in what I shall term for the present the principle of interaction. Moreover, it should be noted that the interaction is between the elements constituting the cause and not between the cause *and* the effect. Thus relevancy plus interaction yields the result, but relevancy minus interaction, or irrelevancy by itself, does not. The cause of an occurrence, therefore, primarily draws attention to *the elements* of a cause. Even then, however, we satisfy the demands of one problem only when we turn to hydrogen, oxygen, and the electric spark as the relevant objects of the effect "water." Two additional problems would demand explanation; the problem of relevancy *versus* irrelevancy, and the problem of interaction *versus* non-interaction.

When our interest is in "what" combined with "what" is the cause of another particularized "what," sequence may suffice as a methodological description of causation, because causation is empirically conditionable and because causation is regular, or is assumed to be regular, in the mode of its behavior. But to direct attention to a bare correlation of "whats," and by so doing to draw attention *from* the facts of occurrence and relevancy—however valid this may be in the pursuit of certain problems—ceases to be valid when the result of the analysis is offered in conjunction with regular occurrence as an *adequate* analysis of causation. The play "Hamlet" with the prince left out would offer less in the way of caricature. For let us ask the simple question: Will *A* and *B* taken together be followed by *C*? Suppose, for the sake of the argument, we answer in the affirmative. Next, let us ask if *C* is different from either *A* or *B*? Suppose, overlooking certain difficulties, we again answer in the affirmative. Here, then, we have the factor of "change" in the form of an origination. As an aspect of experience it is as clearly

distinguishable as any other. Hence, it not only needs explanation, but it would persist in demanding explanation, whether it occurred *with* variation in the history of the universe or whether it recurred *without* variation. For the present, the history of thought is sufficient evidence that, ignored or overlooked, origination does with no ending return to plague us. The fact of origination granted, the statement I now advance is that in seeking its cause, we meet a problem of the same general order as would confront us in seeking the cause of such events as sound or motion.⁷

But to this mode of approach tradition might seem to close the door. Thus, I might be asked: Does not this very reference of an effect to a cause, in an inquiry directed to an empirical proof of its objective reality, imply a prior faith in the existence of the very thing under discussion? In the demand itself, it might be said, are you not acting in response to a principle, subjective or *a priori*, that compromises the whole problem at issue? But this type of objection, I rejoin, confuses two very distinct things. It confuses the problem involved in a possible *connection* of an effect with a cause (which may be either subjective or objective in its foundation), with the problem involved in the bare *cause* of an empirical origination. In fact, if cause and effect have a *connection*, it may be that the "cause" of an empirical origination yields the most unquestioned principle in its support. Thus Hume, by the help of *custom*, established one kind of linkage between them; but the principle made evident in the second inquiry may itself function to correct custom. And if, upon Kantian ground, we affirm a pure thought-basis for the linkage, the degree of dependence in thought upon a like empirical basis would remain an open question; and to the extent of a *dependence* in thought, give evidence of an existing *independent* order. In fact, it is in view of the issue here created, that I now make the specific claim that causation, conceived as a sequence, not only compromises the special question at issue in causation (Kant being the most striking failure), but that causation, thus conceived, never comes to the possession of a foundation that is not in some form or other purely subjective or thought-made. Tradition, taken in plain facts, has enforced little else. The mistake of tradition lies, therefore, not in its *analysis* of causation as sequence, but, rather, in the *identification* of causation with sequence. As a correction thereof, I would, in the first place, identify causation with an empirically determinable and an empirically conditionable type of

⁷ My aim, to be sure, is not to unravel all the mystery thus naturally embraced, but to push it back, as I said, two steps—steps of a radical significance for metaphysics. See two other articles of mine in this JOURNAL; Vol. XI., page 655, and Vol. XIII., page 253.

phenomenon; and, in the second place, still more narrowly identify causation with the cause of an "origination," which like sound or motion may be viewed as existing in specific instances or as a specifically generalized type of phenomenon.

I term "origination," then, a specific type of thing, just as I would term sound or motion a specific type of thing, without entering upon the discussion, here irrelevant, how or by what process of thought we come to the acceptance of this or any other of the variety of distinctions commonly affirmed in human experience. By the term "origination" I imply merely the partial or complete *extinction* of *A*, *B*, and *C*, in their *formation* of *E*, as, for example, the extinction of hydrogen and oxygen in their formation of water. However far we push our analysis, we shall continue to find sufficient mystery. The fact remains, nevertheless, that the passage of hydrogen and oxygen into water is a passage so radical in form as to give rise and shape to an aspect of experience as distinct as that of motion or sound. Accepting extinction and origination, then, as facts, I would raise the question: What constitutes their cause? And to this question I venture the answer: the cause lies in the *interaction* of its relevant elements, with the emphasis now, not upon relevancy, but upon the principle of *interaction*. I shall consider the matter of relevancy more fully a little later.

The difference in the capacity of an object in one situation or in a number of them *to act*, and in another situation or series of them *not to act* upon other specific objects is, as a general characteristic of objects, a distinct fact of experience. The fact that interaction may, from the standpoint of a sensuous cognition, be inferential in its status, in no way invalidates the fact that a given object, *A*, is inert in respect to *B* and *C*, but active or effective in respect to *D* and *E*. Thus viewed, change is a mere sign or index of (1) the existence and (2) the characterization of interaction. (1) As a sign of its existence, an effect or change constitutes merely an objective (and not a purposive or subjective) principle in the determination of relevancy *versus* irrelevancy;⁸ and (2) an effect or change characterizes the interaction existing between the relevant objects of a cause as of this or that *kind*; namely, physical, chemical, psychical, moral, or whatnot. Hence, we may abstract this property in objects—of interaction or non-interaction—and not concern ourselves

⁸ Note, please, that the interaction (hence the relation or connection) is not between the effect *and* the cause, but between the objects, which, taken together to the exclusion of other objects, constitute the "cause." "We do not proceed in causation from a 'relation' to 'change,' but we proceed from a 'change' to the claim that such objects as involve a change indicate a dependence or connection—a relation—which neutral objects, by comparison, are seen to lack." I quote from an earlier article of mine in this JOURNAL, Vol. XI., pages 658-663.

further with the specific *kind* of interaction or non-interaction involved. It is in this generic sense, therefore, that I would reserve the term "interaction" as *the foundation of bare occurrence*. But when, turning our attention from the bare cause of an occurrence, which the generic term "interaction" adequately supplies, we inquire into the cause of a particularized occurrence, as, for example, the cause of iridescence, then the more generic term "interaction" ceases to meet the demand. In the latter case our problem consists no longer in ascertaining the mere ground for occurrence, but, rather in determining "what" is combined with "what" in the *accepted* occurrence of another particularized "what." An assurance in the existence of interaction is as inevitable as the recognized difference between merely "relevant whats" and "relevant whats plus change in one or more of them." Our location of this principle in the relevant objects rather than elsewhere or nowhere is equally inevitable. To take a simple demonstration, consider hydrogen and oxygen as jointly isolated; and then, solely by a variation in their temperature, either have them initiate their extinction in the formation of water or have them fail to do so. Repeat the process to and fro and with or without the result as often as you like. Then if you still remain loath to ascribe the "cause" of these differences—to produce and not to produce the result—to a *difference* in the capacity of objects to act or not to act (especially when all other objects have been rigidly excluded), where may the "cause" be located? The question needs only to be stated to reveal the absurdity of any other answer than the one offered.

But to affirm that interaction is as much an ultimate characteristic of a given group of objects as non-interaction, brings us, in metaphysics, in collision with much that, in Berkeley and Hume, has grown to be traditional. As opposed to Berkeley and Hume, chemistry, for reasons that I shall set forth in connection with relevancy *versus* irrelevancy, has no scruples in substituting the term "properties" for the term "qualities" in the identification of objects. What we find in Berkeley and Hume is a half-truth expressed dogmatically. They affirm, strongly enough, non-interaction or disconnections in the existence of objects, but they also most emphatically deny interaction or connection. Thus Berkeley ceaselessly reiterates that objects are inert; that they have in them nothing of action, activity, or agency. "All events," as Hume writes, "seem entirely loose and separate. . . . They seem conjoined, but never connected." In meeting this position, I advance the statement that both connection and disconnection, or, if we prefer, interaction and non-interaction, are relative to the existence of a change. Hence, deny the reality of change, and you deny the reality of both, and that of

causation as well. Affirm the reality of change, and you have your sole basis for affirming the reality of any one of them. As such, they are equally ultimate, equally relative, and all of them alike, directly unobservable. *Per se* the terms connection, disconnection, and relation have no reality. All we have are objects either reciprocally effective as based upon an accepted empirical evidence of change, or reciprocally inert as based upon an *accepted absence* of an empirical change. Causation and non-causation, therefore, in the sense of bare occurrence, have their foundation in part at least in the two fundamental matter-of-fact aspects—to act and not to act—that any specific object may have in changing degree and variety with other objects.

We may conclude, therefore, that objects as a matter-of-fact experience interact, and fail to interact; and that different objects behave differently in this respect toward other objects. Objects, therefore, in their mutual dependence as well as in their mutual independence imply the existence of objective differences. Relevancy *versus* irrelevancy, no less than interaction *versus* non-interaction, has its foundation, then, in differences in objects that are purely objective. For that objects operate thus differently in respect to each other is an indubitable fact. But that such differences are also incapable of a reduction to a sensuous equivalent is equally indubitable. Objects, therefore, in their mutual dependence and in their mutual independence (for the same object may be dependent in respect to certain objects and independent in respect to others) represent a range of *mutual determination that is independent of any psychophysical agency*. The main business of chemistry is the tabulation of such differences in the mutual behavior of objects. It is instructive to note that mere symbols are sufficient for it in the organization of its data. The reason for this is that a chemist is primarily interested, not in the differences that may be bound up with the direct and isolated identification of objects, but rather in that sphere of differences *incident to objects in their mutual operations*. The operation or absence of operation disclosed in connection with the objects of its inquiry is accepted by the chemist as a fact of ultimate experience; hence, we must stand equally ready to accept *differences in objects* that are ultimate and objective (non-sensuous). The implication of their existence is as inevitable as the claims of chemistry to the standing of a science. But it must not be overlooked that ultimate and objective differences are present in the reciprocal behavior of complex objects as clearly as in the reciprocal behavior of such more elementary objects as chemistry presents.⁹ Thus the complex things,

⁹ For a fuller elaboration of this issue, see this JOURNAL, Vol. XI., pages 603-607; Vol. XIII., pages 253-256.

water, sugar, and lemon-juice, in respect to lemonade, are equally ultimate in their unique capacities to function one way rather than another—differences in objects that are independent of and inaccessible to a sensuous cognition. The *results* of their reciprocal actions, notwithstanding, prove them to be ultimate, different, and real. The emancipation of epistemology from the leading-strings of psychology offers a tempting next-step in the way of an exposition.¹⁰ In the interest of the more immediate problem, causation, I merely mention the implication for epistemology, and pass on.

In an analysis of causation, I find that several distinctions must be kept carefully in mind. These distinctions are best drawn forth by the aid of a simple concrete case of causation. The variations of one instance of it from others are not vital. Let us, therefore, consider the case of iron magnetized by the aid of electricity. First we have the iron and the electricity in their mutual independence; then we have them in their interaction, in which state magnetism, although clearly dependent for its existence upon the interaction, nevertheless acquires a status as independent as iron and electricity prior to their interaction. Now in our ordinary way of dealing with the matter in metaphysics, we term the iron and the electricity the cause, magnetism the effect, and the process, a sequence. To affirm or deny a tie or a relation between cause and effect is the next step commonly adopted. But this ordinary procedure is easily shown to be an error. To begin with, it is not valid to speak of iron and electricity in their mutual independence as the cause. They do not exist as a "cause" until their interaction. But the interaction no sooner exists than the effect or some effect is also present. Now to speak of a cause as the foundation of an effect is misleading, if we fail, as we commonly do, to distinguish between iron and electricity in their mutual independence, and iron and electricity in their interaction. In their mutual independence, they constitute no cause at all in the real sense of the word; and in their interaction, they are no longer mere cause, but also effect. How, then, out of this situation can we extract a meaning for the term "sequence"?

For answer, I turn to Kant. He summarizes the foundation of causation in a brief passage. "It follows, first of all," he writes, "that I can not invert the order, and place that which happens before that on which it follows; secondly, that whenever the antecedent state is there, the other event must follow inevitably and necessarily. Thus it happens that there arises an order among our

¹⁰ Such an exposition would involve a proof to the effect that an individual is "neutral" as well as "effective" in the determination of reality. I have attempted this specific proof in Vol. XIII., pages 259-265 of this JOURNAL.

representations in which the present state points to an antecedent state . . . and connects that event with itself by necessity, in the succession of time,¹¹ . . . as the condition of the synthetical unity of phenomena in time."¹² This passage, easily recognized as typical in Kant's struggle to make an *a priori* element of thought the foundation of an objective causation, resolves itself into three parts. In the first place, he states that causation is a non-reversible order. Now there is a sense in which causation does embody a non-reversible order; namely, the effect, magnetism, follows and does not precede the so-called cause, iron and electricity; but to the extent in which causation, as stated, is reversible, Kant's statement is lacking in truth. Moreover, the causal order is not an order, as Kant would affirm, that of itself determines objects; rather is it an order of things, as has been pointed out, that is determined by objects. The proof of this is found in the fact, as already indicated, that an object may exist and have nothing follow it. Hence, when Kant claims, in the second place, "that whenever the antecedent state is there, the other event must follow inevitably and necessarily," he states what is absolutely untrue of a non-causal situation and also of iron and electricity prior to their interaction; for in neither case does anything follow. And if, in another situation of relevant objects, something does happen (I avoid the word follow), then Kant begs the very thing at issue when he fails, as he does, to discriminate, and to give the ground for discrimination, between the very different situations involved, and presented in our illustration. In the light of such omission it is not surprising that Kant remains unable to tell why in one case we call a given object an antecedent, in another, a consequent, and in a third, neither an antecedent nor a consequent.

The third part of Kant's argument introduces the subject of *connection* in causation. He holds that in the succession of time the present state of necessity points to and connects itself with an antecedent state. The connection he seeks to establish is a connection in sequence. The connection involved in the interaction of the relevant elements of a cause is ignored. Yet the only basis that Kant, in the last analysis, offers in support of a *connection in sequence* is the need in thought, if you will, to unify a succession in time. He fails, in the first place, to perceive that "time" in itself offers no differentia of causation, since "time" is as much involved in the synthesis of a non-causal as of a causal situation. And, in the second place, he fails to note the rôle of *interaction*, without which, however, his units (as illustrated) are iron, electricity, and magnetism in

¹¹ "Critique of Pure Reason," Muller's translation, page 162.

¹² *Ibid.*, page 160.

their mutual independence. Hume's formulation of the identical situation, therefore, is more within truth when he writes "that one event follows another, but we never can observe any tie between them"; for, as with Kant, not only is the intervening fact of an interaction overlooked, but the connection is sought for *in sequence and not between the multiple objects constituting the cause*. For the foundation of a sequence, however, Hume offers custom. Now it is true that "custom" or a "synthetic unity in the succession of time" may yield a basis for a distinct type of sequence. But since a given effect, magnetism, can not be associated at random with any object or objects, but, by the principle of causal relevancy, is to be associated with certain objects only, then a principle must be admitted to exist which is not only independent of custom, but which, within certain limits, is itself invoked either to correct or determine custom. And the same thing may be said of Kant's "synthesis." For if it were true, as he affirms, that causal sequence has its foundation in "the synthetical unity of phenomena in time," how would he explain the existence of error incurred when a wrong group of objects is embraced in the origin of a certain result? The objective order, thus clearly intimated, is entirely ignored. Neither Hume nor Kant, therefore, has attained a foundation for causal sequence in any sense of the word commonly demanded. But suppose we, on our own account, now raise the question as to whether an objective connection exists between magnetism *and* iron and electricity. To this we may reply that in their mutual independence no *objective* connection can be said to exist between them; and that in their interaction, the *connection* is obviously between iron *and* electricity and not between magnetism *and* iron and electricity. I am contending for a metaphysical fact, not for the foundation of a methodological aim.

Turning to chemistry, we meet with what seems a more plausible ground for connection in sequence. Thus a chemist speaks of water as H_2O for the reason of its origin from and its possible resolution back into H_2O without any loss of weight throughout the process. Hence for him water and H_2O , as indicated by the formula, are one and the same thing. But by thus denying to water a distinctive reality the chemist logically denies the reality of change, and, thus naturally, that of causation as well. For he does not have *three* things, water, hydrogen, and oxygen, but only hydrogen and oxygen. There is no need for enlarging upon the point. The illustration serves in a striking way to prove that the principle of identity can not yield an *objective* basis for a causal sequence between two things, when, as may be perceived, this principle, pushed with the

rigor of an absolutist, first reduces the two things to one.¹⁸ Hume, adopting the other extreme, affirmed that cause and effect were fundamentally different. But whether cause and effect are wholly alike or wholly different, or partly alike or partly different, the foundation for a connection between cause and effect would, in any case, be *subjective*, even though the grounds upon which either may ultimately come to repose would embrace principles more or less objective. And among so-called objective principles, interaction and its correlative non-interaction among specific objects are preeminent. The particular *result* bound up with objects in interaction is another fact; and its regular or irregular occurrence is a third fact. As such, the two latter involve the element of *necessity*, not an *objective connection* or *relation* in any clear sense of the words. The term, relation, demands the existence of an empirical change within a limited group of objects; the *existence* and the *kind* of relation are not otherwise recognizable or definable except by reference to a specific *kind* of change.

III

I turn from causation to uniform recurrence. The fact of interaction, I admit, approximates in its nature that of an inference. Uniform recurrence, on the contrary, approximates in its nature matter-of-fact reality, and, as such, it is directly observable and capable of demonstration. Referring again to chemistry as one science among others, we find uniform recurrence exemplified in the laws of constant proportions and constant weights. In fact, a large sphere of its activity is given to determine, within its own province, whether nature really does act with a more or less fixed regularity; and, in so far as the chemist can thus discover uniformity or constancy in occurrence, the basis for a science *versus* mere history is established.

But to this Hume might be thought to reply: What is gained by all this nicety in present determination of recurrence in a world that involves a future as well? Every future judgment, he would go on to say, involves faith in a *continued* constancy; it does not involve merely the fact of a past and present constancy. I admit this objection, but I do not admit it without certain obvious reservations that Hume overlooked. In the first place, if we must face the future with nothing but the past to stand upon, we must not forget that that past itself at one time involved a future, in the course of which the faith in nature's regularity would pragmatically come to displace the opposite faith. But this reservation only scratches the problem. A fact of far deeper significance appears in the Humian

¹⁸ It represents Bradley's mode of approach and criticism of causation.

claim that knowledge ceases when uniform recurrence ceases. But the fact is, that only one *kind* of knowledge would cease—the type of knowledge based upon recurrence as ultimate. But a knowledge of nature—and this can not be denied—would still be a knowledge of nature even if history, under the changed and changing conditions, were the only kind of knowledge that nature made accessible. Thought and purpose may be constitutive, but an objective causation and an objective recurrence are constitutive of knowledge in a more ultimate and superior degree. Hence, whatever the form in which occurrence and recurrence are found to exist, together they represent the objective order of things and a standard of truth. I can not, however, enter here upon further discussion of the matter.¹⁴

Hume's arguments on uniformity preserve their negative validity only where, in the first place, we confuse recurrence *as the basis of a universal predication*, with recurrence *as a matter-of-fact experience*; secondly, where knowledge, such as it is, is discredited or ignored in the extended organization and basis it actually possesses through the conservation in knowledge of a vast identical past with the augmentations of the present; thirdly, where the possibility of a changed state in recurrence is unduly exaggerated into a high order of probability; and, lastly, but most important of all, where, as is still maintained in many quarters, uniformity is held to as inaccessible to proof, for the reason that thought in its proof of recurrence must itself rely upon the truth of the very thing at issue. But no argument can be made to inveigh against recurrence that does not apply to knowledge in any other form whatsoever. A general distrust in the reliability of thought to deliver truth is out of place, therefore, when mixed up with the fact of recurrence as something special and peculiar to it. Uniform recurrence, where employed in the guise of a postulate, lies wholly within the control of its matter-of-fact experience. It is derived from and not prior to that experience. Hence, its future use will be a problem in probability, which the future matter-of-fact experience, however, will convert into either fact or error.

An incorrect conception of causation is in large measure responsible for the many one-sided "isms" that have dominated philosophy. I offer the revised conception of causation without appending the "isms" that I recognize as rooted in it.

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¹⁴ I have given this matter fuller discussion in several publications under the title of relativity.

A LAYMAN'S QUESTION ABOUT THE "FREUDIAN WISH"
AS INTERPRETED BY E. B. HOLT

TO a layman interested in ethical education "The Freudian Wish," by E. B. Holt, comes as a book of real stimulation. When tested by practical experience, the conclusions of the book seem manifestly to contain much that is true and practically helpful. A critical rereading, however, has raised several questions, one of which touches upon the basic idea of the author, namely, the idea that the subjective nature of the soul is done away with. Holt maintains that subjective categories have been eliminated; that the superstition of a "subjective ego" has been banished. Is this true? As will shortly appear, the critical point in the transition from mere reflex action to "behavior," according to Holt, is a certain process of "integration." He nowhere defines or explains what this "integration" is, and I must confess that it looks to me strikingly like a "subjective category" and not very different from certain doctrines of the soul that are maintained by subjectivists.

Let me present my question in the form of a dialogue between Holt's text and my own marginal notes:

Text.—"We shall do well if we consider this wish to be, as in fact it is, dependent on a *motor attitude* of the physical body, which goes over into overt action, etc." (p. 4).

Marginal Note.—Is not the actual process *vice versa*, that is, the motor attitude dependent upon a mental disposition?

T.—"One will best, I think, not hypothecate to this end [*i. e.*, to explain the energy which drives the machinery of 'wishing'] any such thing as 'psychic energy,' but look rather, for the energy as expended, in the nervous system, which does, in fact, establish the motor attitudes, etc." (p. 4).

M.—Is it all, then, merely a complicated form of reflex action?

T.—"It is clear, then, that of two opposed attitudes only one can be carried into effect; the other is 'suppressed'" (p. 5).

M.—True. But why is the one chosen and the other left?

T.—"In other words, by the combined operation of two reflexes the animal swims *toward the light*, while either reflex alone would only have set it spinning like a top. It now responds specifically in the direction of the light, whereas before it merely spun when lashed" (p. 53).

M.—But was it not *trying* to swim toward the light with the one reflex? It then also responded specifically to the light, even though ineffectively.

T.—"The mere reflex does not refer to anything beyond itself" (p. 54).

M.—Did not the first reflex refer to the light quite as truly as the double reflex?

T.—"And I believe that in fact this intelligence is solely the product of accumulated specific responses" (p. 56).

M.—All right, but how and where are they accumulated?

T.—"This constant function, involving always the two things—living organism and environment—is that which constitutes behavior And we must not forget that 'purpose,' in any sense you may choose, howsoever intellectual or indeed moral, is precisely the same thing" (p. 59).

M.—What is included here under the term "living organism"? Is not a purpose, or at least many a purpose, an idea or an ideal rather than merely a course of action? It is conceivable, and as a matter of fact often happens, that the same purpose may suggest different, if not opposed, courses of action, for example, the purpose of safeguarding the United States against foreign aggression.

T.—"The impulses of the sensory pattern may be so weak as to produce no gross muscular contractions, but they will then cause varying degrees of muscular tonus; and this is that play of motor attitude which I have previously mentioned. It is thought. It differs from overt behavior only in the small degree of muscular action which it involves" (pp. 68-69).

M.—Is thought always and necessarily a weaker reaction to environment than action?

T.—"In short we can not do justice to the case of the bee, unless we admit that he is a citizen of a state, etc." (p. 79).

M.—Whence comes his sense of citizenship? From a higher "integration"? What is this integration?

T.—"Or, is cognition different in principle from integrated reflex behavior?" (p. 82).

M.—What is included in this word "integrated"?

T.—"There is indeed a mystery behind such motion, but science calls this mystery neither Helios, Neptune, nor *vis viva*, but simply motion; and science will penetrate this mystery by more extended observation of motion" (p. 85).

M.—A thoroughly legitimate and valuable purpose, but will not science, in so doing, merely reveal another mystery? If motion is "explained" by some undefined and unexplained term, as psychic motion is "explained" in this book by the undefined and unexplained term "integration," will the mystery be resolved?

T.—"At best he [the man buying a house] could have told us, 'I am intending to buy a house and to get my furniture in to-day'; exactly what we have observed. And if he told us his further intentions, these in turn could be as completely learned by watching his

movements; and *more* reliably, since men do both think and speak lies" (p. 88).

M.—Action would not necessarily reveal all his thought and might be capable of several interpretations at any one point. Actions often speak lies too.

T.—"A man's conscious thoughts, feelings, and desires are determined by unconscious thoughts or 'wishes' which lie far deeper down, and which the upper, conscious man knows nothing of" (p. 88).

M.—Is this not overstating an undeniable truth? I am perfectly willing to grant, however, that this particular conscious thought of our author has been determined, or at least influenced, by the man deeper down. The overstatement is due to his philosophical presupposition.

T.—"As reflexes become more and more integrated . . ." (p. 91). "As integration advances . . ." (p. 92). "It totally ignores the work of integration . . ." (p. 92). ". . . the subtler workings of integrated objective mechanisms . . ." (p. 93).

M.—What is this integration?

T.—" . . . In this way action is, again, contrasted (as the 'means') with the mental secret of action (the 'end'). This is an unfortunate way of looking at the matter, since in reality, as I have tried to show, that which is so contrasted with the subordinate action ('means'), and is said to be a mentally entertained 'end' and quite different in nature from the means, is after all precisely another action . . ." (p. 93).

M.—Might not the "end" be the satisfaction of a sentiment involving no action at all?

T.—" . . . but I will point out, in passing, that without this fallacy of 'ends' we should never have been afflicted with that fantastic whimsy called 'hedonistic ethics'; which, I incline to think, is responsible for much of modern deviltry" (p. 94).

M.—Perhaps so. I incline to think that without this fallacy of "ends" we should have no ethics at all save "hedonistic ethics."

T.—"The prophetic quality of thought which makes it seem that thought is the hidden and inner secret of conduct is due to the fact that thought is the preceding labile interplay of motor settings, etc." (p. 94).

M.—Very fine. But whence the motor settings and their interplay, labile or non-labile? Integration? What is integration?

T.—"No distinction can be found between function, wish, and purpose; in every case we are dealing with a dynamic relation between the individual's living body . . . and some environmental fact The mechanism of the body incorporates the wish or

purpose But the soul is of course always and forever the *purpose* that is embodied, and not the mere matter . . . that as a mechanism embodies. The distinction is the same as that between the design which an inventor patents and the steel and brass in which the plan is tangibly realized" (p. 95).

M.—If the "design which an inventor patents" is not the physical plan drawn by him (*i. e.*, mere matter again) then it must be his idea. If the soul corresponds to the inventor's design, that is, idea, whose idea is it? Nobody's? In any case isn't this conception quite static? The appeal to Plato (p. 96) gives added color to the suggestion.

T.—"Consciousness is not a substance, but a relation—the relation between the living organism and the environment to which it specifically responds; . . . " (p. 96).

M.—What is included in the term "living organism"?

T.—" . . . the body is the knower . . . " (p. 97).

M.—We read (p. 95): "The mechanism of the body *incorporates*¹ the wish or purpose." Elsewhere in the book will and knowledge are identified. Elsewhere, also, it is stated that the purpose can not be reduced to unintegrated reflexes. It must therefore be an *integrated* body which is the knower. In what does this integration consist? Merely a multiplication of reflexes, or something different?

T.—" . . . the wish . . . contemplates no end whatsoever, just as time itself infers no end" (p. 100).

M.—What is meant here by "end"? Cessation of activity or (manifestly) a goal? The elimination of the first idea by adopting that of continuous process does not necessarily eliminate the second idea, *i. e.*, that of an end or goal. We read (p. 10): "An innate tendency or purpose of an infant is to put out its hand to touch fire." Is not this an "end," even though "another process"; and not "roughly and inexactly so" (p. 10), but definitely and exactly so?

T.—"The above makes clear, I trust, how 'desire' is defined without recourse to subjective categories, and how 'desire' for 'ends' arises through mechanical integration" (p. 109).

M.—How about higher "ends," such as the author's "desire" for truth? Are these caused by, or only accompanied by, "mechanical integration?" If caused thereby what is this integration? It looks dangerously like a "subjective category."

T.—"If the boy has hitherto found in his father a truth-telling man, the father's talk will have conveyed to the boy, not a 'father says,' but a 'tobacco is' (injurious)" (p. 112).

M.—Isn't there an end lurking about here, *i. e.*, personal welfare?

T.—"And specific modes of response toward him are established by the same integrative mechanism" (p. 115).

¹ Italics mine.

M.—But here the “integrative mechanism” recognizes such things as truth and right. Is it the *mechanism* that recognizes such things, or the *integration*? What is this integration? More mechanism, or other than mechanism?

T.—“And we can now see how and why suppressions occur in this world of ours. It is through lack of knowledge” (p. 128).

M.—This strikes me as psychologically insufficient and, in part, untrue. May one not, with full knowledge, still engage in “suppression”?

T.—“Right is that conduct, attained through discrimination of the facts, which fulfils all of a man’s wishes at once, supressing none” (p. 131).

M.—This seems to me to go counter to ordinary life experience, being oftentimes impossible.

T.—“And these *all* hinge on the fallacy of ends: for a certain ‘desirable end’ a man will do this ‘in itself objectionable’ deed. But then when the end is obtained he is grieved to discover that it turns out to be *undesirable*, and he finds that it is rendered undesirable because of the very deed by which he attained it” (p. 132).

M.—Yes, if the end is a concrete act or situation. The case cited will not *necessarily* arise if the end is a general principle. The evil noted is not due to ends in themselves, but to the kind of end adopted.

T.—“The doctrine of the wish shows us that life is not lived for *ends*” (p. 132).

M.—Whatever may be true of the lower forms of life, the higher forms (at least man) seem to live for nothing else.

T.—“That is ethics ‘from below.’ The ethics ‘from above’ are a very different story. There Someone exhorts or obliges *us* to suppress our wishes, and if we observe Someone a bit carefully we shall all too often find that he generously busies *himself* with suppressing the facts” (p. 133).

M.—Is this a *necessary* fault in “Someone,” a *necessary* result of postulating a “Someone”? Is not the antithesis here drawn due rather to the fact that past “Someones,” who have been fathered upon us by tradition, arose more or less divorced from fact? Would not a Someone, who is a Someone of fact, be a real help? Is he not, indeed, rather difficult to escape? It is either that or a *Something*, the established truth of the factual world, set up by our author himself as the one sanction of ethics.

T.—“And this integration of reflex arcs, with all that they involve, into a state of systematic interdependence has produced something that is not merely reflex action” (p. 155).

M.—“Integration” is the most important factor in this book, but it is nowhere explained and is, for all practical purposes, a “*deus ex machina*.” What is it?

T.—“For such neural and reflex terms fail to seize that integration factor which has now transformed reflex action into something else, *i. e.*, behavior” (p. 157).

M.—What is this “integration factor”?

T.—“This hidden impetus was said to be the ultimate secret of psychical causation. But, alas, a secret!” (p. 158).

M.—“Integration” is said to be the ultimate secret of psychical causation, but it is still, “alas, a secret!”

T.—“This fact, that the immediate stimulus recedes in importance is the interesting point about the integration of reflexes” (p. 165).

M.—Of highest interest. For, are these remote stimuli physical stimuli? Do they not tend to become ideas and ideals? Is not “integration,” then, a tendency to respond to an idea or an ideal? What sort of organism can thus respond to such stimuli?

T.—“. . . and the sole question which we need ever ask is, ‘what is it doing?’” (p. 167).

M.—What is the “it”? It has already been admitted that it is not the purely reflex organism. Is it the “integrated” organism? What is the integrated organism? Is it mind, soul? *Where* is it, within or without?

T.—“*Behavior is any process of release which is a function of factors external to the mechanism released*” (p. 167).

M.—Here integration is not mentioned, but it is implied, for it is essential (as previously explained by the author) to the objective nature of the function. Otherwise we have merely reflex action, *i. e.*, a function of factors within the mechanism. But what is integration?

T.—“This fact offers no opening for the introduction here of ‘subjective categories’: . . . ” (p. 168).

M.—The elusive, unexplained category “integration” must be explained or run the risk of being dubbed a “subjective category.”

T.—“And here, if anywhere, evolution turned a corner” (p. 169).

M.—We are told what is behind the corner, *i. e.*, mere reflexes, and what is around the corner, *i. e.*, behavior; but what is *at* the corner? Our author says, “Integration.” But what is integration? The mere word explains nothing and does not satisfy.

T.—“Then presently one finds reflex movements that are due as one must (with Sherrington) agree, to ‘so-to-say stored stimuli’; since the immediate stimulus does not account for the reflex movement” (p. 169).

M.—Here is a ray of light. But do not these “so-to-say stored stimuli” constitute a “subjective category”? *What* is stored? *How* and *where* is it stored?

T.—“Is it any wonder, then, that having ignored the *objective functional reference of behavior*, we are led into the superstition of ‘ideas’ in the ‘sensorium’ which have an ‘objective reference’ to the environment?” (p. 171).

M.—Is “integration” any less of a superstition?

T.—“We have seen that behavior . . . in so far accounts for the phenomena of cognition that it provides a content of knowledge, a willer, and a knower” (p. 177).

M.—Isn’t this over-metaphysical? Should it not rather be said, “provides a bunch of ‘so-to-say stored stimuli’”?

T.—“These various functions are of different degrees of integration, and in a well-knit character they have become organized . . . with one another into higher forms of behavior . . .” (pp. 196–197).

M.—Different degrees of *what*? How *organized*? By integration?

T.—“That is to say, there is at any moment of life *some* course of action (behavior) which enlists *all* of the capacities of the organism; this is phrased voluntaristically as ‘some interest or aim to which a man devotes all his powers,’ to which ‘his whole being is consecrated’” (p. 197).

M.—How else could it be phrased? Thus the spurned “end” is summoned to return in other garments. And yet we are told, “Life is not lived for ends.”

T.—“The more integrated behavior is harmonious and consistent behavior toward a larger and more comprehensive situation, toward a bigger section of the universe; it is lucidity and breadth of purpose” (p. 197).

M.—In other words, “An end set up by ‘integration.’” What is this integration so gifted in the capacity for formulating and pursuing ends?

T.—“According to this view the soul is not substantial and not corporeal; but it is concrete, definite, empirically observable, and in the living body incorporated—a true ‘entelechy’” (p. 201).

M.—The soul is not the body, for it is “incorporated” in it. It is “not corporeal.” Is it idea? Whose idea? If it is not an idea, must it not be some separate spirit-thing?

I am not seeking to criticize this book, for I do not consider myself competent for such a task. And besides I enjoyed it very much and have profited greatly from it. I am merely seeking further information regarding certain things which are not clear to me. In particular, the exact meaning and significance of “integration” has not been made clear to me, and the whole question hinges upon this point. Integration is not defined or explained, and is consequently not proved to be “objective.” Until it is so proved can it fairly

be said that the "superstition of subjective categories" has been entirely discarded?

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REVIEWS AND ABSTRACTS OF LITERATURE

Is Conscience an Emotion? HASTINGS RASHDALL. Boston and New York: Houghton Mifflin Company. 1914. Pp. 200.

This book is made up of three lectures, delivered as the West Lectures, at the Leland Stanford Junior University. The lectures were not written for the erudite student of ethics, but they aim to make certain problems clear to the ordinary intelligent reader. In this Mr. Rashdall is successful, for the lectures are clear and concise, and bring out his points in an interesting and entertaining way.

In the first lecture, Mr. Rashdall assumes that we have moral judgments, that we attach distinctive meaning to the terms "right" and "wrong." The question to be discussed is whether our moral judgments are the work of Reason, and so objectively valid, or whether they may be ultimately reduced to any kind of feeling or emotion or "moral sense."

Let no one think that this is an idle question, that as long as we do know the difference between right and wrong, it does not much matter how we know it, that a rose by any other name would smell as sweet. Mr. Rashdall warns us that our beliefs and destinies, our faith in God, and our hopes of immortality, are bound up with the way in which we answer this question. With this warning in our ears, we sit up and pay attention to the lecture.

Mr. Rashdall gives a brief history of the way different men have answered this question—Hobbes, Locke, Hutcheson, and Hume. Hume brought out the real meaning of the "moral sense" school, started by Hutcheson, and Hume represents its logical outcome. He says that morality is simply another name for the fact of social approbation. Such a theory, reducing morality to mere feeling, has no place for an absolute ought and for ethical objectivity. For men may differ in what excites approbation as they differ in any sense judgment. But, asks Mr. Rashdall, is this so; can morality be reduced to a matter of taste? Have we not got in our minds an idea of "ought"? And this "consciousness of an objective ought" must be derived from the intellectual part of our nature. "No mere emotion could give one such an idea." "If you ask, 'how am I to tell that the notion of duty is not mere emotion in disguise?' . . . I reply, 'How do you know that the multiplication table is not the same thing as a feeling of acquisitiveness?'" . . . "What reason have you for supposing that the judgment $2 + 2 = 4$ may not be a subjective illusion, or that two straight lines can not enclose a space? We have no reason for believing anything, except the fact that we can not help believing it. If the notion of duty is as inexpugnable a notion of the human mind as the

notion of quantity or cause or substance or the like, we have every reason that we can possibly have for believing in its objective validity."

In conclusion, Mr. Rashdall reiterates that there are self-evident moral judgments and that these are intellectual judgments of universal validity. "Moral consciousness is no mere sense or emotion, but a particular activity of that self-same Reason, the validity of which is presupposed by all our knowledge."

Some readers may feel that this discussion is behind the times, that it should be gently laid away in a drawer full of old lavender, that "moral reason" and "moral sense" are both obsolete terms. So in the second and third lectures, Mr. Rashdall takes up the more modern ethical theories of evolutionary or naturalistic moralists like Professor Westermarck and Dr. McDougall, and of pragmatists like William James, and endeavors to show that for all their up-to-dateness they are really voicing the same old theory of what may be comprehensively called "Emotionalism in Ethics." In the second lecture called "The Morality of Savages," Mr. Rashdall deals with the theories of the evolutionary moralists, and his criticism is interesting and to the point.

Mr. Rashdall says that the older moral sense school believed in a simple distinctive feeling of approbation, a specific feeling. Modern writers deny this, and treat the moral consciousness as a complex of many different feelings and emotions and base their conclusions on a wide survey of the evolution of morality out of the non-moral consciousness of the animals, and the imperfectly moral consciousness of savages.

According to Dr. McDougall certain instincts have played a large part in the evolution of morality. This is true, and anthropology is unquestionably the trump card of emotional moralists. But the stubborn question remains, "Is there anything in the idea of right and wrong which is not mere emotion?" That most of the savage's actual morality can be explained upon the emotional view is conceded by Mr. Rashdall. He even admits that quite possibly the whole of it might be so explained. "Indeed if we only go low enough in the scale of evolution, such an admission is inevitable. Nobody contends for the existence of a category of duty or of absolute value in the dog or even in the monkey."

The question may be asked then what reason is there for supposing that this is not so with the developed morality of civilized man? Mr. Rashdall answers that "the existence of a distinct category of moral obligation or value, must be a matter of immediate consciousness. I know by immediate introspection that I can form these judgments of value." And if one asks what reason we have for believing them to be valid, Mr. Rashdall again appeals to the willing, but overworked multiplication table. We have as much reason for believing them to be objectively valid as for believing that $2 \times 2 = 4$. Because these moral judgments did not exist in the animal and existed very imperfectly in the savage, there is no reason for questioning their validity now. The validity of a notion is not affected because it had a beginning in time. "If Socrates had been the first man who ever definitely conceived the idea of duty, that would not alter the fact that such a notion did exist in the mind of Socrates, and in many men since

Socrates." "The notion of duty if it exists in the developed human intellect of to-day, is not shown to be invalid because our ancestors—human, sub-human, or animal—had it not, any more than the validity of the multiplication table is affected by the discovery that some savages can not count more than five." Mr. Rashdall finds the analogy of other intellectual notions such as quantity, quality, substance, to be helpful. For since in the mind of the savage there is great confusion of these categories, and it is only gradually that they become clear, so it is not strange that there should be a gradual transition from a vague emotional morality to a rational morality.

Although morality never becomes purely rational, yet it always has in it a concept of the right or good, which can not be resolved into any kind of emotion. And this idea of an intrinsic higher and lower, right and wrong, dominates even the ideas of those who like Westermarck deny its validity most strenuously. Even Westermarck believes his own idea of life to be higher than that of the savage, though according to his theories, he has no right to do this.

Mr. Rashdall concludes this lecture by saying that the denial of validity to the idea of duty has a strong tendency to impair its practical influence, and it is therefore a matter of great practical as well as intellectual importance to reject the emotional theory of ethics.

In the first two lectures Mr. Rashdall has tried to show that there is such a thing as a judgment of value, "a distinct intellectual act by which we pronounce something good or bad." In the third lecture entitled "Value or Satisfaction," he tries to make clear what is meant by the concept of "good" or "value" and he criticizes in some detail William James's attempt to identify the good with "satisfaction."

To begin with, Mr. Rashdall says it is significant that all who hold with James and other pragmatists find it impossible to "avoid introducing into their notion of satisfaction an element which really admits that intellectual concept of the good which they profess to deny." For instance, James says that everything that is demanded is by that fact a good, yet goes on to say that since conflicting demands can not be satisfied "let those prevail by whose realization the least possible number of other ideals are destroyed." He therefore demands impartiality in conduct, and is prepared to doom to non-satisfaction some of his desires for the sake of this ideal. Whence does this desire for impartiality arise? Surely from the intellect. "Mere desire *qua* desire cares nothing for impartiality." This demand is a demand of his rational nature and so is objective, for reason is the same in all men, and is objective in its deliverances.

Moreover, says Rashdall, by "demand" James does not mean what a man personally happens to want. Otherwise one would not acknowledge that that which satisfies the demands of thousands is better than that which satisfies the selfish demands of one. But by "demand" is meant that which presents itself to man's rational nature as something that ought to be desired. Thus "the inexpugnable idea of 'oughtness' reveals itself beneath all the phrases which have been carefully constructed to conceal it." "It is plain that so far as the good man's notion of 'good' can be

identified with satisfactoriness, it is what is satisfactory to an ideal self . . . that he identifies with the 'good.'" And that implies an objective standard of good which can not be got out of mere emotion, but comes from the intellectual part of man's nature. "If it be only recognized that the satisfactoriness which constitutes the meaning of 'good' is a satisfactoriness to a self which has a peculiar capacity for judging and valuing ideals there would be no harm in such language." But, concludes Mr. Rashdall, what superiority has this over the old commonplace rationalistic doctrine that "the good is that which is pronounced such by a particular and distinctive activity of that same reason or rational self from which all ultimate concepts or categories of thought are derived."

It is a pity that in these three interesting lectures the clearness of the discussion should be obscured by the constant use of the term objective, as opposed to subjective. A thing can be felt by a subject, belong to a subject, without being thereby "subjective," or without losing "objective validity." But to Mr. Rashdall only the activity of reason has "objective validity," whatever this may mean. It would be a distinct gain to these lectures, and to all philosophical discussion if the terms subjective and objective, weighted as they are with the dust of ages, could be swept aside, and the real meaning to be expressed could be couched in less connotative words. Mr. Rashdall, too, gives the impression of attributing to man two natures, an emotional nature, from which come his feelings, likes, and dislikes, which are "subjective," and an intellectual nature from which come his moral judgments and intellectual concepts, which are "objective." He says that our moral judgments are "the work of reason." Now no one denies that morality and reason are closely connected, in fact morality might be described as the rationalization of conduct, but would it not be a truer account of the situation to describe moral approbation as one way in which a rational being reacts to his environment? Man, being rational, reacts reflectively and hence morally, to his environment. Subjective and objective are irrelevant terms.

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ENGLEWOOD, N. J.

Mithraism. W. J. PHYTHIAN-ADAMS. Chicago: The Open Court Company. Pp. 95.

Some years ago Franz Cumont ceased to write upon Mithraism, because he had, at that time, practically exhausted the material. Since his works appeared there has been little further light thrown upon the major problem of the study—the content of the belief and the inner history. The literature dealing with the syncretistic religions of the Roman world, however, has multiplied exceedingly, and through the widened inquiry the understanding of this most interesting cult has grown somewhat. This is an exceedingly handy and well-gotten-up survey of the religion of Mithras arranged for the use of students of comparative religion; popular, clearly stated, and concise. It refrains from going afield into the general situation and thus gains in directness of presentation; but the bibliographical apparatus is singularly incomplete even for so slight a manual, and it is

to be hoped that readers of it will be stimulated to secure some glimpse of what has been done by German scholarship as well as by Mr. J. M. Robertson and Solomon Reinach! Why did the publishers ignore their own translation of Cumont's work on "Oriental Religions in Roman Paganism"?

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JOURNALS AND NEW BOOKS

THE AMERICAN JOURNAL OF PSYCHOLOGY. April 1916. *The Tridimensional Theory of Feeling from the Standpoint of Typical Experiences* (pp. 157-170): W. S. FOSTER AND K. ROESE.—There seemed to be no supporting evidence for the Wundtian three-dimensional theory of feeling. There was supporting evidence for the hypothesis proposed by Titchener and Hayes. *Primitive Notions of the "Self"* (pp. 171-202): ARTHUR J. TODD.—In early notions the ego and alter were not clearly defined. The self is essentially social and as the mind works in unity it reflects a unified self and controls it. *A Marked Case of Double Inversion* (pp. 203-216): GEORGE F. ARPS.—A careful report of a peculiar case of inversion and the corrections that have been made by teaching a close combination of visual and tactual interpretations. *The Significance of Clothes* (pp. 217-226): SYLVIA H. BLISS.—The desire for clothing grew out of the "nakedness" of man modified by the desire for decoration and protection. *A Method of Testing the Strength of Instincts* (pp. 227-233): HENRY T. MOORE.—Words are presented to which a verb association is given. The nature and quickness of the associated verbs form the basis for determining the strength of various common instincts. *Measures of Variability* (pp. 234-244): E. J. G. BRADFORD.—A method is presented for finding the variability when a series of constantly improving measures is considered. This distinguishes variability from improbability. *The Causal Relations between Structure and Function in Biology* (pp. 245-250): E. STANLEY ABBOTT.—Mechanically structure determines function. Teleologically function determines structure. There results a great need for the study of environment. *A Note on Color Preference* (pp. 251-255): M. LUCKIESCH.—Preferences were shown for the saturated colors. *Initial Spurt in a Simple Mental Function* (pp. 256-260): J. CROSBY CHAPMAN AND WILLIS J. NOLAN.—A short initial spurt is shown in addition tests. *The Effects of Practise in its Initial Stages in Lifted Weight Experiments and Its Bearing upon Anthropometric Measurements* (pp. 261-272): SAMUEL W. FERNBERGER.—No less than fifty records should be taken. The effects of practise are strong at first, but decrease as experimentation proceeds. *Minor Studies from the Psychological Laboratory of Cornell University. Simplicity vs. Complexity of Color Hues* (pp. 273-282): E. M. ALSPACH.—Colors that are said to be made up of others seen so in successive shifts of altitude. Blue seems most like itself. *Book reviews* (pp. 283-289).—Clara Schmitt, *Standardization Tests for Defective Children*.

Robert M. Yerkes and Helen M. Anderson, *The Importance of Social Status as Indicated by the Results of the Point Scale Method of Measuring Mental Capacity*. Thomas H. Haines, *Diagnostic Values of Some Performance Tests*. Thomas H. Haines, *Point Scale Ratings of Delinquent Boys and Girls*. R. Pintner, *The Standardization of Knox's Cube Test*. H. F. Adams, *The Adequacy of the Laboratory Test in Advertising*. F. Sioli, *Die Abwehrfermente Abderhalden's in der Psychiatrie*. *Proceedings of the Society for Psychical Research, Volume XXVIII*: Amy E. Tanner. Alexander Philip, *Essays Towards a Theory of Knowledge*: B. H. BODE. James Jackson Putnam, *Human Motives*: CHRISTIAN A. RUCKMICH. Ad-dington Bruce, *Sleep and Sleeplessness*: CHRISTIAN A. RUCKMICH.

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NOTES AND NEWS

THE January-February, 1916 number of the Russian journal, *Ques-tions of Philosophy and Psychology* (*Voprosi Filosofii i Psychologii*) is devoted to a discussion of the philosophy of Prince S. N. Trubetzkoj. In the "Contemporary Significance of the Philosophical Ideas of Prince S. N. Trubetzkoj" the author, L. M. Lopatin, expresses his regrets con-cerning the present state of affairs in Europe and attributes it to the "moral bankruptcy of European culture." Among the numerous causes which have contributed to the catastrophe is the continuous struggle be-tween the spiritual and mechanical (characterized by realistic naturalism) aspects of the universe, and this struggle has now reached a critical point. The struggle can well be traced in the attempts on the part of Descartes, Leibnitz, and Spinoza to compromise the two; later, Kant's doctrine that man finds an end in himself was followed by Hegel's philosophy where man is never an end in himself, but is only a passing manifestation of the universal spirit, a part of the whole organism; and still later realistic naturalism triumphed in the Ego of Stirner and in Nietzsche's Superman who sees in religion only the morality of slaves, but himself finds freedom in the realization of the fact that all morality is the creation of man. Nietzsche's philosophy was, of course, not accepted in its entirety in Ger-many, but it contributed greatly toward the extinction of Christianity in

her cultivated persons. This, therefore, makes Lopatin dofulness of a scientifically rational view of morality. But to meet the philosopher on his own ground, he merely a physicist can not prove that there are no unphysical agent the conservation of mass and energy be experimentally true hypotheses we must seek for bases independent of experimental naturalism does not give any theoretically basic answer real." The author therefore hopes to find the answer in Philosophical School," characterized by the name of V. S. to whom stands his pupil S. N. Trubetzkoj. The latter put the basic principle that conditions all our thoughts and basic condition of the possibility of knowledge and experience contained in the inner spirit of the universe, the universal eternal real spirit—God. In the moral world God is Love, and man's life should be the realization of the doctrine "Love as thyself." The author concludes that at present when in the midst of a bloody storm very many would have professed followed the teachings of S. N. Trubetzkoj. The next part S. N. Trubetzkoj's View of the World" by S. A. Kotljarev most part a description of Trubetzkoj's personality. His "concrete idealism" inseparable from Christianity, ethics, and (patriotism). In the last article, "Religio-Philosophical Views of S. N. Trubetzkoj" G. A. Rachinskij holds that the alpha Prince Trubetzkoj's philosophy is the reconciliation between religion and reason. To achieve that he must regard religion and philosophy closely related. Philosophy is an outcome of religion and seeks to reform the religions of the peoples. Metaphysics in its history consists of the people's religious understanding and imagination. Religion supplies the positivism and absolutism on which metaphysics is based. In the conflicts of religions, Christianity was victorious. Moral considerations must conform with the teachings of abstract moralism rejecting mysticism is therefore invalid; and the keynote of Christian ethics: "Act so, that God, in whom we live, seems, in your action, more real than the world and than you." Ethics is also the study of the absolute, for it recognizes that the absolute almighty moral beginning, i. e., God; and so immediately connected with Christian dogmatism.

PROFESSOR WALTER S. HUNTER, of the University of Texas, was appointed professor of psychology in the University of Kansas in 1914, a vacancy caused by the removal of Professor Robert M. Ogden from the University.

THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY

AND

SCIENTIFIC METHODS

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

THE TRUTH PROBLEM

I

THERE appear to be at least four fundamentally different senses in which the term "truth" is employed. In most discussions of the topic either these four senses are blended, or some one of them is asserted to the exclusion of the others. I believe that the general problem of truth is to be solved by distinguishing these four senses and then accepting them all, each in its place. I shall call these senses logical, ontological, existential, and psychological. Truth in the first or logical sense is that 'is'-character which is represented by the verb without the sign of negation. It corresponds to the "affirmative quality" of judgments in Kant's half-psychological, half-logical account of the categories. I shall refer to it as "positivity" or logical sign. Truth in the second or ontological sense is referred to in symbolic logic by the "assertion" sign, and in ordinary language by the expression, "it is a fact that." It is the same as the category of 'being,' that which is signified by the categorical form of the verb. I shall also employ the term "factuality." Truth in the third or existential sense turns on the peculiar relation between a universal and its instance, or between a variable and its value. That which is true in this sense is said to "hold" of something. I shall also employ the term "validity," intending to imply that to be valid is always to be valid of. The fourth or psychological sense of truth applies only when there is an act of mind such as thought; and is then an adverbial qualification of this act. One is in this sense said to think "truly." I shall also refer to this sort of truth by the term "correctness."

Before undertaking a closer examination of these four sorts of truth, there is one principle of method that should be made explicit. It is as necessary as it is proper to assume that we can use our minds without introducing them into the discussion. Suppose, for example,

¹ So far as it is possible to do so consistently I shall employ the double quotation marks when a word is quoted; the single quotation marks when the word's meaning is intended.

THE JOURNAL OF PHILOSOPHY PSYCHOLOGY AND SCIENTIFIC METHOD

All communications to the Editors should be addressed to **PROF. J. E. WOODBRIDGE**, or Professor **WENDELL T. BUSH**, Columbia University, New York City.

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Before undertaking a closer examination of these four sorts of truth, there is one principle of method that should be made explicit. It is as necessary as it is proper to assume that we can use our minds without introducing them into the discussion. Suppose, for example,

¹ So far as it is possible to do so consistently I shall employ the double quotation marks when a word is quoted; the single quotation marks when the word's meaning is intended.

that we are following the proof of the geometrical theorem that the square on the hypotenuse of a right-angle triangle is equal to the sum of the squares on the other two sides. In following such a proof we employ verbal images, we doubt, conjecture, infer, and conclude; but these states and acts of mind are not parts of the geometrical field of inquiry and do not themselves become a topic for discussion until the attention is shifted. They are no more relative to the proof than is the fact that I am using chalk or wearing glasses. It would be improper to ignore them only provided their introduction would make the geometrical equality in question more evident. Similarly when I see that this green is different from this blue, I may ignore the fact that I am seeing these colors because it contributes nothing to the evidence for their difference. It is an afterthought, a new topic, and not a constituent of the original topic. This is equally the case when the mind itself is under discussion. The fact that I am using my mind when I am studying it may be ignored, until that additional and more complicated fact of self-consciousness is expressly brought forward. The application to the matter in hand is this. If it is possible to discover truth-properties of a sort that do not contain my mind as a constituent, or depend on it as a part of their evidence, then it is proper and necessary to ignore the fact that my mind is discovering them. This new fact must be reserved as a new topic, and await its turn. *What* we are judging or thinking in any given case is one thing, which may or may not involve mind; but the fact that we are *in that case* judging or thinking is at any rate irrelevant. To introduce it is to raise a distinctly new question which must not be confused with the old. No discussion can be coherent without the adoption of this principle. It is a commonplace of science and of vulgar opinion. But philosophers, I think, can afford to be more mindful of it. Its present bearing will appear more clearly as we proceed.

1

Let us first consider the logical sense of the term "truth." This sense is inherent in the principle of contradiction, or in what Mr. Russell calls "the contradictory function." I am unable to see that in this fundamental sense the distinction between truth and falsity is other than that between positivity and negativity. Mr. Russell, at any rate, employs "not- p ," "the negation of p ," "the contradictory of p ," and " p is false" as equivalent expressions. The symbol " $\sim p$ " may be read in any one of these ways, according as linguistic convenience may dictate. The distinction is most familiar in the terms "is" and "is not," or in the fact that every language contains an

² Cf. "Principia Mathematica," Vol. I, p. 6.

adverbial negative. For everything of the sort that is referred to by the grammatical sentence, for every relational complex, there is a hypothetical negative. Thus *the* negative of the fact that France and Germany are at war is 'France and Germany are not at war'; and this fact has a determinate negative because to have such is characteristic of this type of being. In other words, it is always significant to qualify a verb by the introduction of the term "not." Let us call this type of being a propositional complex, since this expression has the advantage of ignoring the differences between propositions, propositional functions, relationships, and facts, while calling attention to their formal similarity. We may then say that every propositional complex is reversible, contradictable, or capable of being negated, in the same sense that it must contain an act or relation, and at least one term. This is an abstract property of the propositional complex, known by inspection.

It is well, perhaps, to note that positivity and negativity are not simple opposites, or of coordinate rank. This is suggested by the fact that there is no positive adverbial particle or logical symbol. The reason, I think, is this. The original form of the propositional complex is positive. The negative form is an alteration of the positive form. p and p -positive are the same thing; whereas p -negative is something different. To say that ' S is truly P ,' or 'indeed P ' is mere tautology or rhetorical emphasis; whereas to say that ' S is not P ' is to say something different from ' S is P .' But this alteration or reversal may be repeated indefinitely, and always with effect. 'Not,' though it may be ungrammatical, is never tautologous.

In order to express the law of contradiction it appears to be necessary to attach a meaning to "not- p is true," as when we say that ' p is false' implies 'not- p is true.' It is, therefore, necessary to admit that while a multiplication of positivity is redundant, the positive qualification of a negative is significant. If we were to say so that added positivity never made a difference, then we should in the above case have 'not- p implies not- p ,' simply. But the situation may be met by distinguishing between 'not (p)' and '(not- p),' where what falls outside the bracket signifies the logical sign of the whole. In that case '(not- p)' would be positive since there is no sign-symbol outside of it; its absence being taken to signify positivity. The above law of contradiction can then be expressed: 'not (p)' implies '(not- p).'

These successive reversals that are expressed by a multiplication of negatives are not new propositions about old propositions. To find that ' p is false' is not to find that 'the proposition p is a false proposition'; but it is to state a new proposition derived by the alteration of the old. Grammatically speaking it is an adverbial

change, with other parts of the sentence remaining the same; and it reflects the possibility of generating from any original propositional complex a series of propositional complexes which differ from the last only in what we may call "logical sign," that is, in that each is the contradictory of its predecessor.

This is all independent of the mental acts of affirmation and denial, or of positive and negative acts of mind generally speaking. It is independent of the act of judgment in so far as this is conceived, for example, by Windelband, as "*Beurtheilung*"; that is, as an attitude of 'for' or 'against,' of 'yes' or 'no,' of acceptance or rejection. According to Rickert, "*der eigentliche logische Kern des Urteils, das Bejahen und Verneinen, ein Billigen oder Missbilligen, ein Stellungnehmen zu einem Werte ist.*"⁸ But positivity and negativity are more fundamental than this duality of attitude in judgment. For, in the first place, it is possible to inspect the sign of propositional complexes with entire impassivity. Seeing the difference between p and not- p does not require that I shall nod my head in the one case and shake it in the other; nor does it require that I shall be cognizant of the difference between accepting and rejecting. In short, accepting and rejecting are not constituents of positivity and negativity in general, nor do they throw any light on the nature of this distinction. On the other hand, however, acceptance and rejection themselves can, I think, be understood only in terms of positivity and negativity in the more fundamental sense. Rejection, for example, is the kind of act which tends to an end-result which is negative. Thus to reject the notion of spontaneous generation is to strike an attitude such that a state of things in which the derivation of life from inorganic matter is not possible, would satisfy it, or agree with it. So, generally speaking, there is no other way to define positive attitudes of mind as a class, including such attitudes as accepting, liking, affirming, desiring, etc., except by saying that they tend to 'is,' whereas their opposites, such as rejecting, disliking, denying, aversion, etc., tend to 'is not.' It is evident that this has an important bearing on the theory of value. Without such a primitive notion as I have proposed it is impossible to distinguish between such values, for example, as aversion to life, and love of death. But using the analysis which I have proposed, we can say that the aversion is a propensity which tends to the not-being of life; whereas the love of death is a propensity which tends to the positive quality of some state of not-living.

It is no less important to see that contradiction in the logical sense is independent of physical or mental antagonism. Thus,

⁸ Cf. Windelband's "*Präludien*," third edition, pages 52-53; Rickert's "*Gegenstand der Erkenntnis*," page 108.

although p and not- p are contradictories, so that p implies not (not- p), it is by no means the case that the assertion of p is mentally incompatible with the assertion of not- p , or mentally causes the denial of not- p . If this were the case, then it would never be possible that one should contradict one's self. It would never be possible to correct assertions and denials by appealing to the principle of contradiction.

The situation appears to be this. The assertion that 'the earth moves' is an attitude such that this positive fact would satisfy it. It is a tendency in the direction of this fact. The denial of the motion of the earth tends similarly to the negative fact, 'the earth does not move.' These two facts are instances of p and not- p . The assertion and the denial can exist together, but certain contingencies which define them are contradictories. What we require for this situation is a pair of processes of which certain later phases are instances of contradictories, whereas certain earlier phases are not. Consider, for example, the case of inhibition. The actual equilibrium in which neuro-muscular forces balance one another has nothing to do with contradiction. But we may say of two neuro-muscular processes that a phase to which one tends, or which it would reach if it were to complete itself, is related to a prospective phase of the other, as p and not- p . Similarly a collision taken as a mass of debris is not a contradiction. But we can say of a train moving east and a train moving west on the same track, that there is a hypothetical position of the first train, such as its arrival at Buffalo, which is related to a hypothetical position to the second train, such as its arrival at Detroit, as are p and not- p . These positions do not both occur, and their relation is not a relation between two facts. But the two trains exist and their courses are such as to be contradictorily determined or qualified. The contradiction itself is the formal relation of p to not- p , and enters into the situation only in so far as a hypothetical instance of it is contained in the definition of the schedules of the two trains. In other words inconsistency of mind, neuro-muscular inhibition and physical conflict are not the originals of contradiction, but have themselves to be explained in terms of contradiction in the more fundamental logical sense.

This logical sense of truth and falsity is, then, an inalienable characteristic of a certain type of being. There is no such thing, in other words, as a propositional complex without sign. Formal logic devotes itself to the study of this and kindred properties, such as disjunction, conjunction, the variable, implication, etc. But even logical knowledge embraces more than the bare apprehension of these properties. It discovers certain specific propositions about the propositional complex as such. These latter are the theorems or laws

of logic. But these have to do with truth in the ontological or categorical sense, to which we must now turn.

2

Let us first illustrate our second sense of truth from the formal realm of logic. Thus we may simply call attention to the contradictory function, that is, to the peculiar difference between p and not- p ; or to a categorical fact of contradiction, such as ' p implies not (not- p).'⁴ This distinction is illustrated, for example, by the difference between ' p implies q ' and ' $(p$ or q) implies p .' The latter appears in formal logic with the so-called "assertion" sign prefixed to it; the former is said to be merely "considered." I believe that it is possible to rid this distinction altogether of the psychological associations that cling to the terms "assert" and "consider." When one considers p , one does not have a proposition before the mind, but propositionality. Similarly, for ' p implies q ,' one does not have before the mind the propositional fact that p implies q , but the general character of implication with the duality of terms which that involves. It is not a propositional complex because it lacks terms. That is to say, p does not stand for anything except the term-character, or term-reference, which is a part of the implicative as of other relations.⁴ When, on the other hand, one asserts that $(p$ or $q)$ implies p , one has terms as well as the implicative relation, ' p or q ' being the nature of the positive disjunctive relation, and q having the specific character of being the same on both sides of the relation. There is no relational complex unless there is something which is in the relation in question. If there is, then the assertion sign may be attached to the symbolic propositional expression. In other words, it is a question as to what is before the mind, and not of the attitude of mind itself.

It may be argued that this does not meet the difficulty that the same proposition may be considered and asserted, and that this possibility is essential to logic. Thus, the proposition ' p implies p ' which is asserted in logic, may appear as a constituent of the proposition ' $(p$ implies p) implies $(p$ implies p),' where it is not asserted. It is to be noted, however, that no such proposition as this appears among the propositions of logic, because it merely exemplifies the law ' p implies p .' It is equivalent to asserting that there is a proposition, namely, ' p implies p ,' of which the law that a proposition implies itself holds. Logic does not discover instances of laws, but only

⁴ p does not mean 'other than q ,' nor do p and q both mean mere propositionality. The first interpretation would give an erroneous proposition (in the sense considered below). The second interpretation would mean that every proposition implies itself, and should be expressed, ' p implies p .'

laws which are whether there is anything that obeys them or not. To say that in ' $(p \text{ implies } p) \text{ implies } (p \text{ implies } p)$,' ' $p \text{ implies } p$ ' is not asserted, means simply that it is not found. It is not there, so far as logical discovery is concerned. It is there only in so far as it is discovered in some extra-logical manner that there is a proposition which affords a case of the logical law.

This non-asserted factor in propositions is more familiarly known in cases of physical or mental particulars, and its non-assertion is more commonly expressed in the hypothetical form of speech. Thus, we say, "if the earth is a sphere, then all points on its surface are equidistant from its center." This every one would grant to be a fact, even though he denied that the earth is a sphere. If the total fact is independent of the earth's being a sphere, then the earth's being a sphere can not, *as a constituent of it*, be itself a fact. And if we are careful we shall say, I think, that what we really see is not anything about the earth, but what is implied in sphericity. Instead of "the earth" we might better say "the earth, for example," or "anything." So the non-asserted proposition 'the earth is spherical' simply isn't there, except in a verbal or symbolical sense yet to be accounted for. Even so something else can be substituted for it without altering the fact which is known.

Similarly, it is a fact that you are reading this. 'Your reading this' is a complex of the propositional sort, and it possesses the ontological or categorical status. This is different from its positivity which is opposed to the negative character of 'your *not* reading this.' Its factuality is opposed to the character attaching to 'you' as a constituent of the complex, or to 'your reading this' as a constituent of the complex 'your reading this implies your not ignoring this.' 'You' are not a fact because 'you' are not a propositional complex. In ' $(\text{your reading this}) \text{ implies } (\text{your not ignoring this})$,' 'your reading this' is not a fact because in the total fact, this constituent has no terms. The total fact, as one sees that it is so, is independent of 'you' and of 'this.' It is equivalent to ' $p \text{ implies not } (\text{not-}p)$.' The total fact does have terms, namely, 'positive proposition' and 'double negative of the same proposition.' The fact 'you are reading this,' although a fact, is not a logical fact, because it contains the terms 'you' and 'this,' which are not among those general structural properties of propositional complexes which distinguish the terms of logic. Thus a fact is a propositional complex with terms. It is found as such, and not created by the act of knowing. A non-fact is anything that is not a propositional complex; or a propositional complex without terms. It commonly appears as a constituent of a fact. A logical fact is a fact in which the terms are propositional complexes without terms. It is a fact about the propo-

sitional complex as such, in which the terms are variables; or a fact in which what is given is the nature of one or more universals and their relations.

To sum up, then, we may say that in logic certain abstract data, such as the characteristics of the propositional complex, are brought to light. Among these properties are positivity and negativity. Logic also brings to light certain propositional complexes in which these properties are the terms. These propositional complexes may not improperly be called "logical facts." They are true both in the sense of having the character of positivity, and in the further sense of having the categorical or ontological character. They possess truth of both sorts quite independently of any knowing mind. It is impossible to characterize a knowing mind or any other similarly complex existent without appeal to these varieties of truth as more primitive. It is true that these facts are arranged in logic in an order of "inference," or "proof." This, I believe, means two things. In the first place it means simply that some of the facts are implied jointly by others. But these trains of reasoning are not themselves among the purely logical facts or theorems. They are introduced because, in the second place, logical facts, if they are to be apprehended at all, have to be apprehended in a certain order. There is a necessary order of evidence or exposition, for which the only objective basis is this order of joint implication. A logical treatise aims to get logical facts apprehended. It will therefore place first what it is necessary to have seen in order to see what is placed after. In saying that logical facts are "about" propositional complexes without terms, or propositional functions, we have already employed the third sense of truth, to which we now turn.

3

We have now to do with the situation in which there is a propositional complex with variables on the one hand, and something that is a value of a variable, on the other hand. It is what we have when a law holds or is valid of something, or an event fits a description, or a thing enters into a relation. It is fortunately not necessary to adopt any consistent nomenclature, or reach any precise account of the distinction. It is perhaps nothing more than the distinction between a universal and one of its instances. All that we do need to assume is that this is an objective distinction, holding of our world regardless of whether that world be mind or matter. There is, so far as I can see, no possibility of doing away with universals. The effort to do so has never, as Mr. Russell has shown, accomplished more than the reduction of other universals to similarity, and such a reduction disposes of no difficulties.

Let us consider an example: ' x to the right of y ' prescribes what shall be the case with any value of x or y . If there is a thing (such as this hand with which I write, w), which is a value of x , and another thing (such as this hand with which I hold the paper, h), which is a value of y , then ' w to the right of h ' describes the one and ' w to the right of it' describes the other. There are two things which obey the law ' x to the right of y .'

There are two aspects in which "truth" appears in this situation. First, I say of the law that it is "true of" my right hand; or that it is true of existence generally in the sense that there is a value for the variable. Second, I say of the value that it "satisfies" the law, or is "true to" it. The former is the sense in which the laws of Euclidean space are said to be true of nature. The second is the sense in which Lincoln is said to be a true man, or the orbit of the earth a true ellipse. They are true to some general function or law. It is in this latter sense that the term "true" is sometimes used interchangeably with the term "real." A "real" difference is simply an instance which satisfies the relation of difference. This sort of truth may be termed "existential," if we use this term to signify 'instance' or 'case of,' as when we ask "breathes there a man with soul so dead," etc.?

It does not appear, however, that there is any corresponding sense of falsity. The law which does not hold of an event of nature is not 'false of' that event, because it is not in any discoverable sense 'of' it at all. Triangularity is not false of Shelley's "Ode to a Skylark"; it is simply irrelevant. Similarly, the event of nature that does not satisfy an equation, is not 'false to' that equation, it is not 'to' it at all. Even if there be a law which nothing obeys, it is not false of existence. It simply does not relate to existence. One can, if one wishes, say that a law is false of everything that it doesn't apply to; and that a particular is false to every law that it doesn't conform to. But even so, this does not provide for the cases in which a law is said to break down in a particular application, or an event to violate a specific law. We may say of an event which obeys a law which is the contradictory of M , that it disobeys M . But why in that case is it held to violate M , rather than any of the other laws with which its law is equally contradictory? Here it seems necessary to introduce a mind which relates a law to an event, by thinking the one of the other. In this way, through the intervention of mind, a law may be misapplied to an event, or an event defeat an expectation which has been created of it.

We must be careful not to assume that all of the general functions that may apply to nature are themselves logical facts. For the majority of them are not. The laws of physics do not, like

the theorems of logic and mathematics, stand in their own right. There would, for example, be no law of gravitation unless nature obeyed it, whereas the laws of analytical geometry hold regardless of nature. The law that the velocity of a body falling to the earth increases proportionally to the time, is logically and mathematically no better than the law that it increases proportionally to the distance. Neither is true inherently, in the categorical sense of the term truth. The first law is true *only* in the sense that it is true of actual bodies in nature. The same is the case with the Ptolemaic and Copernican astronomies. The Copernican astronomy is true existentially or materially, but not formally; the Ptolemaic astronomy not at all.

But what, then, is the Ptolemaic astronomy, or Aristotle's law that heavy bodies fall faster than light? They are hypotheses, doubtless. But what, then, is an hypothesis? It contains two characteristics. In the first place, it is important to note that it has logical structure. It could not be framed at all unless there were certain fundamental truths of the sort already considered. A "genuine" hypothesis is one that is logical or mathematical. It is not a mere combination of symbols. It must exemplify such properties as contradiction, implication, disjunction, etc., and such abstract propositional facts as are contained among the theorems of logic and mathematics. In the second place, it is important to note that it is *framed*; which means that over and above these more fundamental facts which the mind finds, there is a special application or assignment of them which the mind creates and may or may not find. To take a relatively simple case, let us consider the hypothesis that the population of New York is greater than that of London. This is a genuine hypothesis in the sense that there is such a relation as 'greater than'; that is, ' x is greater than y ' refers to a mathematical property. The hypothesis, which contains this relation or function is, as we say, 'intelligible,' in that it means something that one thing should be greater than another; one is saying something when one uses these words. There is also New York, and there is London. But 'New York as a value of x ,' and 'London as a value of y ,' is due to the intervention of mind, at least so far as the hypothesis is concerned. The hypothetical act is this assignment of a given particular to a variable of a given function. The propositional complex 'New York is greater than London' is true of the hypothecating mind, as something which it does; whether or not 'greater than London' is true of New York, that is, independently of mind.

Let us suppose this last alternative to be the case. We then have a law ' x is greater than London' which is true of something, namely, New York, in the third or existential sense of the term truth. But

this law is itself a fact, if we construe it to mean that the principle of having something greater than itself is true of London. Thus a fact may be true of a fact. But the law, ' x is greater than y ,' while true of London, is not itself a fact. This, then, is true only in the third or existential sense. Now if it so happened that London was greater than New York, then the complex "New York is greater than London" would be annihilated altogether, unless some mind entertained it as a hypothesis. In that case it would be true only of the mind entertaining it. It would then be a *mere* hypothesis. But according to our supposition that New York is greater than London, ' x is greater than London' has a triple status; it is a fact, it is true of New York, and it is a hypothesis. When such is the case we have, I believe, the fourth type of truth, to which we shall presently proceed.

Before doing so, however, it may be worth while to indicate the sense in which nature is irrational, or non-logical. A fact which is true existentially may be a logical fact. Thus ' $(x$ is greater than $y)$ implies $(y$ is less than $x)$,' while it is true of New York and London, is also itself a fact. There is such a propositional complex, quite apart from its application to these historical cities. It is doubly true; it is true existentially, as the law of something, and it is also a mathematical fact holding of the property of magnitude. A realm of existence which exemplified only logical or mathematical facts, so that all of its laws were categorically true independently of everything but the bare structural or formal properties of the propositional complex might be termed a purely rational world. It would simply illustrate pure logic and pure mathematics. As a matter of fact, however, the physical or natural laws, although they contain such formal truths, are not as they stand formally true. For, as we have seen, such a law as Galileo's law of acceleration, to the effect that the velocity of a falling body is equal to the time of its fall multiplied by a constant, is true *only* in the sense that actual falling bodies obey it.

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(To be continued)

THE LOGICAL SIGNIFICANCE OF THE PARADOXES OF ZENO

THAT the paradoxes of Zeno still maintain their interest for the student of logic is a significant fact which has been recently emphasized by the discussion of these problems in Mr. Bertrand Russell's volume, "Our Knowledge of the External World." In this work the conviction is expressed that these ancient difficulties

have now received a final solution through the formulation of a positive theory of the infinite, and this is cited as affording a brilliant illustration of the triumphs which we may expect to achieve in philosophy when the method of logical analysis comes into its own. Russell's solution turns upon the definition of a mathematical continuum as applied to space and time; the question of the nature of space and time is placed in the foreground, and the solution assumes an actual infinite. It seems to the writer, however, that the paradoxes may be regarded from a different point of view, and that, by so shifting the standpoint, the above problems are seen to be merely subsidiary and incidental. Without attempting to deny that the nature of space and time is in some sense involved (in the argument of the stadium this is the proximate, though not the ultimate, issue), it may be doubted whether any view which puts this issue in the foreground poses the problem in its most fundamental form. It seems to me at least, that an even more universal and significant issue is raised by Zeno's arguments; and that unless this is clearly grasped, the bringing in of the problem of the infinite tends rather to confuse than to clear the logical situation.

The central problem of the paradoxes is nothing less than the problem of the nature and limits of logical explanation, and consequently, of the relation between reality and logic. Russell asserts the principle that logic is confined to the formulation and invention of possibilities, as distinct from a determination and limitation of the actual.¹ But this is only one aspect of the matter, and concerns the validity of Zeno's arguments only indirectly. Russell also affirms that the analysis of change and continuity is a problem whose solution is a necessary pre-condition for understanding the world, and that this is preeminently a task for logic.² If this is true, it becomes important to apprehend clearly the nature and significance of logical explanation. For unless we do this, we may find ourselves confronted with an insoluble problem, on account of having raised an illegitimate question; we may be lured into the pursuit of an ancient will-o'-the-wisp under a modern guise. It is in their relation to this question that Zeno's arguments prove their enduring vitality; for they furnish a crucial test of the limits of logical explanation. It was no doubt Zeno's purpose to prove the unreality of space and time and motion, and of the pluralistic universe generally. It must be confessed that his arguments are not sophistical, nor capable of an easy and superficial solution. Nevertheless, they are capable of another interpretation than that which he himself put upon them; instead of implying the unreality of change, they may be

¹ "Our Knowledge of the External World," p. 58.

² *Op. cit.*, p. 16.

regarded as demonstrating the impotence of logic to construe the reality of change. This, at least, is the standpoint from which I wish to discuss them.

The argument of the race-course seeks to prove the impossibility of reaching the end of the course; it rests the proof upon the admitted necessity of first traversing the half of any remaining distance, a necessity which is never obviated. Let us expound Zeno somewhat freely, but without losing sight of the main point. "For the sake of the argument," we can imagine him saying, "I am willing to admit that the runner is able to traverse half the distance between himself and the goal; and having done this once, I will admit that he can do it again, and so on repeatedly, as long as he likes. But you on your part must also admit that he can not reach the goal until he has first made an end of traversing the successive half-distances which I have thus conceded to him; and this, you will readily see, is impossible. For there will always be another half-distance to traverse, however far along the runner may have advanced in the course of this serial progress."

What is now the root of the difficulty? It evidently consists in this, that from Zeno's concession to the requirements of the runner who wishes to reach his goal, there is no logical transition; physically, the difference may become as small as you please, but logically, the gulf is a yawning chasm. Zeno conceives and defines the runner's advance wholly within the qualitative determination: "some half distance this side of the goal"; from this there is no logical transition to the qualitatively different determination: "at the goal." The transition is a logical "leap," for it is what Aristotle calls a *μεταβάσις εἰς ἄλλο γένος*. The puzzling character of the argument is due to the fact that Zeno's initial concession constitutes a quantitative approximation to the goal, which is alluring to the imagination, since the runner is constantly getting nearer and nearer, until the intervening distance seems so small that it may be neglected; but the self-constraining immanence of the initial logical assumption is then brought to bear, and we are sharply reminded that the runner's progress is defined only within the sphere of the "not-yet-there." The beauty of the argument lies in the triumphant victory of the thought over the seductions of the imagination and the blandishments of the quantitative approximation. The thought insists on respecting the boundary line between one quality and another; in spite of the fact that the confusion and weariness of mind caused by the never-ending process of diminishing the intervening distance, seeks relief in letting it be finally wiped out, the thought holds this tendency in check and immutably insists on the basic fact that Zeno has conceded its diminution by one half only.

Russell replies to this argument by pointing to the fact that there really exists something beyond an infinite series. We might just as well have replied to Parmenides's argument for the One, by pointing to the general assumption that more than one reality exists; or invited Zeno to go down to the race-course to see for himself how the runner reaches the end of the course. For the point on which Zeno is insisting is that the limit which such a series approximates is *beyond* the series, not immanent in the series, and therefore not logically implicit in it, but reached only by a leap. And it is this leap which Zeno passionately refuses to take, because for him logic is the sole standard of reality, and a reality which can not be logically construed is a mere appearance. Let us note precisely *why* the completion of the series defined in Zeno's argument is declared to be impossible. It is certainly not on the ground of empirical evidence drawn from the observation of runners. Nor is it on the ground of the fact that counting the steps of such a series one by one, or the imaginative traversal of these steps, is empirically found impossible of completion within a finite time. In the nature of the case such negative empirical evidence is unattainable. The ground is absolutely and purely logical, and does not primarily involve any reference to time at all. The ground is contained in the logical principle that a series so defined as to be endless and therefore as having no last step, can not without a manifest self-contradiction be regarded as ended, so that the last step is reached. This logical impossibility may be viewed secondarily under the form of time; it then translates itself into the proposition that the series can not be completed in a finite time. But this is because the series is in itself incomplete, and incomplete *by definition*. Zeno defines the runner's progress, so far as he is willing to concede it, in terms of a series which has the attainment of the goal outside itself; although this goal is the limit which the series endlessly approaches, the limit remains forever external to the process of approximation.

Zeno's initial assumption may indeed be regarded as sophistical, for it is no more difficult for a runner to traverse the whole than the half of an intervening distance; every actual whole is from another point of view a half. But it must be remembered that the argument is *ex concessis*; in any case, its significance does not depend on the propriety or the impropriety of the initial assumption, but in bringing to consciousness the principle that we can not construe the whole out of the half. The concession of the half proves to be illusory, since it leads to an endless approximation, and the argument very properly insists that half of the intervening distance is not the whole, no matter how small this whole may be.⁸

⁸ The argument has here been discussed from the point of view of a pro-

The essence of the argument of the race-course, and of the remaining arguments as well, can therefore be stated without any reference to the infinite. The reference to the infinite is collateral; in the first and second arguments it is introduced as the result of an apparent concession yielded by Zeno in favor of the possibility of motion. The concession turns out to be illusory, because it merely defines an operation of approximation of such a nature as always to remain within the sphere of the "not-yet-there"; the conclusion of the argument brings this to consciousness, and motion is seen to be possible only on condition that it shall never arrive anywhere. The second argument, of Achilles and the tortoise, is essentially identical with the argument of the race-course, except that the concession is here introduced in another form. Instead of the process of halving the intervening distance, we have here offered us as a concession, the process of reaching the point which the continually moving tortoise has just left. As long as the tortoise moves at all, at however slow a rate, this process is capable of repetition; and however often repeated, it does not pass over into the logically transcendent process of catching up with the tortoise.

The reflective process, specific illustrations of which are thus experimentally introduced into Zeno's two first arguments, is inherently infinite. It contains no immanent principle which logically necessitates or provides for its own cessation; it contains no immanent principle which logically necessitates or provides for a transition to a qualitatively different determination, Hegel and his dialectic method to the contrary notwithstanding. Here we have a fundamental logical truth, applying to every reflective process, however defined. This principle appears in the reflective process of subdivision as applied to spaces, times, or intensive magnitudes; it applies to the process of positing an anterior cause for an event, and the process of positing a posterior effect for a cause; it appears in the process of representing a spatial beyond, and a temporal before or after; it is the process in accordance with which the infinite series of finite numbers is produced by means of the repeated addition of *one*; it is the magic by which the mathematicians produce an infinity of ideas out of one object of thought, by means of the repeated positing of an idea of the already posited idea; it applies to the relation between a universal and its embodiment in particulars; it is therefore regressive series, but essentially the same considerations apply if we interpret the argument as positing a regressive series, by which the runner is prevented from making a start. If, before traversing the whole of any initial distance, it is necessary that he should have first traversed the half, then, since every half is for the next reflection apprehended as a whole, he will not be able to traverse any initial distance, however small; for the argument concedes only the half of such a distance.

the secret of the inductive leap, and of the approximative character of the natural sciences, and of all the historical disciplines; it applies to the analysis of a given totality into its aspects or qualities; in short, it applies to all reflective processes however defined. The principle involved is, that if a thing can be done once, it can be done again; for the sphere of the logically possible is quite incommensurable with the sphere of the actually possible, and is not subject to the influence of the quantitative. But this absolute quantitative freedom of the reflective process is matched by an equally absolute qualitative restriction; for it can not transcend the logical immanence by which it is initially defined. The self-representative map-system which begins with England does not finally transform itself into a map of the United States, or enlarge itself to cover the universe in its scope; and the approximation-process which is defined as remaining within the sphere of the "not-yet-there" does not finally leap over into the "there." Not because there is insufficient time; this is an imperfect expression for the self-restraint of the logical immanence, and has deceived many a thinker into accepting a solution of Zeno's paradoxes based on the infinite divisibility of time, whereby any infinite process becomes commensurable with any finite time. But such a solution is in danger of missing the point entirely; it solves the problem, not by solving it, but by matching it with a parallel problem which it does not solve. The insufficiency of the time is an inadequate and misleading expression for the logical impossibility of the transition to a new quality. It is misleading, because it tends to substitute the concept of actual impossibility for the concept of logical impossibility; the supposition that a new quality could finally emerge as the immanent outcome of the reflective process is a logical absurdity, and an immanent transcendence is a contradiction in terms.⁴

But does not the positive theory of the infinite here come to our aid, and does it not throw an entirely new light upon the problem of the paradoxes? By no means; the positive theory of the infinite does not alter the logical situation here exposed in the slightest degree; if anything, it sets it into stronger relief. The advantage claimed

⁴ There is a childish game which mimics the attempt of the understanding to bridge the chasm between one kind and another by means of a quantitative approximation. It begins by counting: one I see, two I see, and so on, until it reaches ten, when it triumphantly brings out, Ten-nes-see, the name of a state! produced quite naturally by the process of counting. It is the very same trick or illusion which is the secret of the supposed explanatory power of the theory of evolution. Because we can discover quantitative approximations, the emergence of a new quality seems somehow less abrupt and miraculous; after a while it becomes almost self-evident, and finally the new quality seems a logical and necessary outcome of the preceding state. Cf. Kierkegaard, "Begrebet Angst," p. 32, where there is a similar remark.

for the newer formulation is twofold. In the first place, it defines the concept of the infinite all at once, by a single logical act, determining the class by the defining property of its members. This is both correct and necessary, for it is the condition that we should have any definition at all. But why is it an advantage as over against the negative theory? The negative theory has precisely the same merit. A definition of the infinite as endless determines the whole endless series or collection all at once, by means of a single *negative* defining property, in precisely the same way that a definition of it as self-representative, for example, determines it all at once, by means of a single *positive* defining property.⁵ The reason why the positive theory seems to be an advance in this respect is that a confusion arises between the endlessness or incompleteness of the series, with the endlessness or incompleteness of the definition of the series. The same confusion arises in connection with the static character of the concept. It is assumed that a static concept can only define states, but not processes. But this is not so. Time as pure duration, as an endless passing by, as a constant vanishing of states which *as states* are therefore non-existent, is just as much a conception of the intellect as is the conception of an instant or of a permanent state. This first advantage, then, is illusory, and is simply a circumlocution for the logical nature of all conception, positive and negative alike. The second advantage of the positive theory is that it starts from a totality posited by definition, which is by definition (directly or by implication) resolvable into an infinity of members. And this is no doubt correct and permissible; perhaps this method of approach is the key to a revolutionary advance in mathematical research, on which question I do not pretend to offer a judgment. But before I can bring myself to admit that it also revolutionizes logic and philosophy, I must ask to have one little question answered; *how* does the positive theory posit the infinite totality with which it starts? Does it construe it out of its single elements, or does it posit it by taking a new point of departure? Happily, the answer is not hard to find, for the positive theory itself not only does not conceal, but openly professes, that no infinite totality is ever reached by a summing up of elements,

⁵ Russell seeks to show by examples that infinite series are not necessarily endless, but that they may have one or even two ends. This involves a confusion as to just what it is that is in each case endless; a finite line has two ends, but the process of determining points on the line, or the process of subdividing the line (the synthesis and the analysis) is nevertheless endless. We have here a confusion of the logical problem of completing an endless process with the problem of the physical existence, and hence the finitude, *from a different point of view*, of totalities whose analysis gives rise to the endless process; in other words, it is answering Zeno by appealing to the fact that the runner can be observed actually reaching his goal. Cf. "Our Knowledge of the External World," p. 179.

but only by shifting to an absolutely new point of view. The leap which in the negative theory is outside the definition is in the positive theory included in the definition—but it is *precisely the same leap*. The positing of infinite totalities which from another point of view are finite, is an old achievement of thought; such totalities we have always with us. If there is anything remarkable or revolutionary connected with the whole matter (which is what one would be led to suppose from the romantic glamor with which the invention of the positive formulation has been invested), it would have to consist in the abolition of the *leap*; in the overcoming, by the technique of mathematics, of the qualitative immanence of logical thought. This would indeed be a remarkable achievement; Hegel staked his reputation as a thinker on the claim of having accomplished it by means of the dialectic method, but history has not judged him leniently in this respect. Take any infinite totality, a line, a duration, or the series of finite numbers; if the reflective process is applied to such a totality by way of analysis, the analysis never becomes complete, never reaches the last elements, without making a leap; if the reflective process is applied to the elements by way of synthesis, it does not reach the totality (or the continuity) except by making the same leap in the reverse direction. The endless subdivision of spaces yields spaces, but not points; the endless multiplication of points yields points, but not a geometrical continuum. The analysis or the synthesis becomes *complete* by a breach of logical continuity; points and instants are not homogeneous with spaces and times, and the one concept is not derivable from the other by a mere quantitative determination.

The positive and negative theories of the infinite thus supplement one another. They express the obverse and converse sides of the same logical situation. The positive theory leaves the inherent negativity of the infinite absolutely undisturbed (in the compact point-series there is no next point; the subdivision of spaces and times gives us no smallest element, and hence no points or instants; a transfinite number can not be reached by counting, etc.). The negative theory, properly understood, does not deny the existence of positive totalities which are infinitely resolvable into elements. Both theories unite in asserting that such totalities are, from the standpoint of the elements, reached by assuming a new point of departure; and that the elements are, from the standpoints of the totalities, reached in precisely the same way.

We need only touch briefly on the third and fourth arguments, since the fundamental principle has already been amply discussed. The arrow is at rest in every position which it occupies (or in every instant); how then can it be said to move? We may reply, if we

wish, that the initial proposition constitutes an irrelevant tautology; for it is not surprising that the arrow should be at rest *in every position*, position being a determination of rest. (In the same way we may reply that motion takes time, and the instant not being a determination of time, it is a tautology to say that there is no motion *in the instant*, or even in all the instants taken collectively.) Or we may reply, if we prefer, that rest is a concept which requires more than a single instant for its determination, *and also more than a mere collection of instants*, since rest consists in occupying the same position for all the instants included *in a certain period of time*. But these answers lose all their force if there is nothing in time but instants, and nothing in motion but positions. For out of the positions which the arrow occupies, you can not construe the transition from one position to another; and out of the instants which the arrow occupies in its flight, you can not construe the duration in which alone the motion can take place. Both positions and transitions, both instants and times, are required for any adequate determination of motion; Zeno assumes only one of the two mutually supplementary concepts, makes an unsuccessful effort to construe the other, and interprets his failure as evidence of the unreality of motion.*

The argument of the stadium is somewhat complex in statement, and I shall not attempt to elucidate it in detail. Here again the difficulty arises from supposing time and space to be constituted by instants and points, and from the attempt to define motion and its

* In this note I will refer the reader to a couple of passages in Mr. Russell's book, which seem to indicate that at certain crucial points he is unaccountably blind to the issues involved. The first is on page 151, and asserts the necessity of analyzing change completely, by reference to terms which are not changes. We have already shown that this involves a leap out of the immanence of the change-concept. This shifting to a new point of view is not a necessary consequence of reflecting upon changes, but is reached as the result of an arbitrary interruption of this reflective process, by virtue of an act of the will. The second passage is on page 138, and asserts that if the mathematical theory is adequate, nothing happens when a body moves except that it is in different places at different times. The phrase "in different places at different times" conceals the possibility of an ambiguity. If it includes in its meaning the transition from one place to another the proposition is trivial, and says nothing that needs any support from mathematical theory; to be exact, the verb "comes to be" should be substituted for the verb "is." But if not, the proposition is self-contradictory; the idea of a process, as indicated by the word "happens," is equated with the idea of a state, as indicated by the word "is." The proposition is refuted by the basic principle of the Eleatic dialectic: *You can not construe becoming from being*. Either Mr. Russell has overlooked this dialectical boundary, as impassable for logic as the widest chasm; or else he has not overlooked it, but seeks to make the leap in the strength of mathematical theory. In the latter case, his proposal is a recrudescence of the Hegelian dialectic in a mathematical form.

velocity exclusively in terms of instants and points. This is equally impossible whether we assume a finite number of points or instants in a given space or time (an assumption which is certainly false), or an infinite number of such points and instants (an assumption which is undoubtedly correct). For the points or instants do not yield space or time except in conjunction with the idea of a serial order, a before and after, a between; but this idea is simply the notion of a geometrical or temporal continuum in a surreptitious form. The assertion that there is no next point (instant) is merely an expression for the fact that space (time) is not constituted by points (instants); by which we do not mean to deny that it contains them, nor that positions and motions are determinable only by means of a reference to such entities.

The lesson of the paradoxes is thus not a mere clarification of our ideas of space and time; they do not pose an esoteric and highly technical problem, soluble by the progressive refinement of our logical and mathematical methods. They teach that the fundamental principle of all logical explanation is the principle of immanence; or in other words, of ground and consequence. Logic is therefore compelled to confess its impotence when confronted with the problem of explaining change. This does not mean that change is mere appearance; such an assertion is a perversion of the voice of logic, which philosophers have allowed themselves through misunderstanding its scope and function. Every change and every transcendence is a breach of logical continuity, and hence from the point of view of logic, a paradox. The far-reaching consequences of this principle I can not here undertake to suggest; but the history of philosophy and of science is full of attempts to dash the head of the intellect against this impenetrable wall.

In conclusion, let me try to express this principle in a slightly different form. Professor Royce and Mr. Bradley have each formulated a logical principle having a bearing upon the problem we have here discussed. Although Royce seems to regard the two formulations as in some sense antagonistic, it is possible to combine them in a single formula, and this formula will then sum up the argument of the present paper. Bradley says: *Thought can not make differences.* Royce replies: *Thought begets, as the self-evident outcome of its own unitary reflective purpose, an endless process.*⁷ I assume, and the preceding argument must be the warrant for my assumption, that these two theses must be combined; they constitute, in fact, the obverse and the converse side of the same principle. I also assume that the additional considerations which Bradley and Royce, re-

⁷ Cf. Royce, "The World and the Individual," I., p. 473, where Bradley is quoted.

spectively, regard as expansions or implications of their respective principles, must either be rejected or re-interpreted. When Bradley, for example, adds that Thought can not receive differences from the outside, and ready-made, he evidently places himself at the viewpoint of Zeno. In so far as he intends to assert that immanence is a *sine qua non* of every form of logical apprehension, our argument has sought to establish the same position; but in so far as he identifies Thought in general with logical apprehension, he ignores the function of Belief as a supplementary mode of thought. For Belief is the form in which we apprehend the transcendent. On the other hand, when Royce seeks to interpret the endlessness of the reflective process as typical of the way in which a monistic principle logically unfolds itself in an infinite multiplicity of forms (thus substituting logical emanation or development for the idea of creation as an explanation of the world of space and time), it will be necessary to urge that the endlessness of the reflective process is always a repetition of the same; that it never passes over into a new quality; that its apparent "movement" is precisely analogous to the uniform velocity with which a moving body continues to move when free from the influence of every external force; that this endlessness, like the uniform motion of the moving body, is inherently static (not involving any change) and purely ideal, and thus affords by itself no description or type of any actual happening in any actual world; and, finally, we must urge that the arguments of Zeno, who was also a monist, constitute the historically valid objection against every attempt to establish a logical bridge between the One and the Many. On the basis of this understanding I propose, as a summary of the argument contained in the preceding pages, the following unification of the two principles quoted above: *The endless quantitative approximation toward a new quality which is implicit in the process of reflection remains always within the quality initially posited, thus testifying to the impossibility of a necessary logical transition from one quality to another.*⁸

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REVIEWS AND ABSTRACTS OF LITERATURE

The Idealistic Reaction against Science. A. ALIOTTA. Translated by Agnes McCaskill. London: Macmillan and Company. 1914. Pp. xxii + 483.

This work is a revision of the author's "La Reazione idealistica contro la scienza," 1912, made for presentation in English dress. Besides the

⁸ I owe the underlying idea of this paper to a study of Kierkegaard, whose logical position I have sketched in a paper published in a recent number of the *Philosophical Review*.

labor of correction and improvement Professor Aliotta has undertaken a certain rearrangement of his material. The constructive portions, formerly scattered through the book, he has now collected into a concluding chapter which gives the outlines of his spiritualistic realism. The earlier—by far the more extended—parts are devoted to an historico-critical discussion of his immediate theme. The translation runs easily and fluently, in spite of the inordinate length of the paragraphs—the longest, one might conjecture, since the “*Kritik der reinen Vernunft*.” And in so far as can be gathered without the original at hand, the rendering is accurate. Here and there the reader queries whether certain small ambiguities existed in the original text. But in a much greater proportion of instances it is evident from comparison with the sources of the doctrines described that the work of translation has been successfully accomplished.

These few ambiguities may also proceed from another cause. Part I., “The Reaction from Intellectualism in the New Theories of Knowledge,” ranges from Spencer to Royce and Münsterberg, considering neo-criticism, empirico-criticism, neo-Hegelianism, Bergson and his school, and pragmatism on the way. Part II., “The New Theories of Mathematics and Physics,” covers the non-Euclidean geometry, logic and mathematics, energetics, and the like. The method of presenting these wide-ranging theories is the historico-critical. The doctrines considered are stated by interpretative narration. The critical remarks are appended in separate sections, or suggested in connection with the principal theses. Now and then the reader must be careful to note just where history stops and criticism begins, or even to distinguish the primary doctrine from its narrative reproduction. But these blemishes are few and of minor importance. In the main, the author puts the reader in his debt by his extended and accurate review of recent thinking in so far as this bears upon his central theme. There are few books which can be so heartily recommended as summaries of recent epistemology, alike in its philosophical and in its scientific forms. The trained student will here find reminders of much of his own reading, and in addition suggestive reports of work that perhaps has escaped his direct study.

The title of Professor Aliotta's treatise, however, hardly describes its content. It would be more precise to term it *The Reaction against Intellectualism, and its Culmination in Recent Scientific Methodology*. Intellectualism the author takes in the widest sense of the word as “those epistemological systems which assign an autonomous value to the cognitive function”; and he counts as “forms of reaction all those which . . . make the value of science and knowledge in general depend upon . . . other functions of the mind and rank will and imagination above intellect” (p. xxii). Hence he is led to discuss both the conflict between intellectualism and voluntarism or emotionalism and the conflict between rationalism and empiricism, intuitionism, etc. So the currents of his thinking cross and re-cross. But there can be no doubt of the point at which his most successful work is achieved. Far better than the majority of recent writers Professor Aliotta recognizes and emphasizes the accurate analysis of the elements of cognition and of their reciprocal relation. He

will have naught of pan-logism or of abstract dialectic, although it might be said that his inclinations are rather toward the rationalistic than the empirical tradition. He will have naught of empirico-criticism or of pure empiricism or intuitionism, when these are taken in their absolute forms. Thought and intuition, perception and conception he finds alike integral to the cognitive process, so that one-sided systems which emphasize either phase to the neglect of its fellow inevitably lead to reactions of the most extreme type. This is the teaching of history since the time of Socrates, Plato, and the Sophists. And critical analysis shows the historical rhythm grounded in the nature of the case.

Armed with such principles, Professor Aliotta is in a position of advantage when he examines recent epistemological theories. Empirico- or agnostic evolutionism, neo-Idealism, pragmatism, intuitionism betray their several elements of weakness if they are tried by these critical tests. In particular, he is able to expose the fallacies of the ultra-phenomenalistic views of science. Here too a reaction against intellectualism has gone on. From dogmatic naturalism later methodologists have turned toward the economic and symbolic interpretation of scientific laws, toward science as concrete sensorial prevision, toward "science without hypotheses," toward phenomenalistic energetics, and the like. But this is clearly reaction. And in all these theories, when they are taken literally, it is easy to show the fault. Science never is divorced from thought, for it never can be; perception, even of the simplest kind, includes intellectual factors. The phenomenalistic methodology but repeats the errors of classical empiricism: the elements of intellection necessary to scientific knowledge are tacitly assumed; or the results of intellection are mistaken for pure percepts and substituted in their room; or, if the genesis of thought is considered, its forms are elicited from the data because they have first been introduced among them, etc. In the main the argument here is just and salutary. And it is certainly pertinent to the discussions of the day.

The final chapter broadens noëtics into metaphysics. As all knowing involves intellection, so it presupposes rational relations to a rational environment. But knowledge is a function of personal subjects alone. Nature, then, is rational and real; but mind is its end and goal. So realism of the spiritual, or as it was formerly termed, of the ideal type is the metaphysical view to which epistemology leads. Further, epistemology implies an Absolute Consciousness to which mind and nature and the relation of the two are present, for "faith in the value of science is faith in God" (pp. 460-5). This consciousness is an Absolute Self-Conscious Personality, eternally active and creative, who may be validly conceived after the analogy of man's nature, since anthropomorphism of a reasonable kind is present in all our thought. These conclusions, as we have said, are stated in the final chapter of the treatise. Much about them is attractive. But they are sketched rather than elaborated in the present work. The burden and the success of this is in epistemology proper. In

this field it is a substantial addition alike to the later historical discussions of the subject and to the more recent critical arguments.

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What Should I Believe? An Inquiry into the Nature, Grounds and Value of the Faiths of Science, Society, Morals and Religion.
GEORGE TRUMBULL LADD. Longmans, Green, and Company. 1915.
Pp. xiii + 275.

This book, the third in a series of four, following naturally after "What Can I Know?" and "What Ought I to Do?" is an attempt to show the reasonableness of moral and religious belief and the duty of believing. The main difference between knowledge and belief is that in the former there is always some awareness of the grounds on which our assent rests, whereas in belief proper we give our assent without being conscious of the grounds. This, however, does not mean that belief is necessarily unreasonable. "Instinctive belief is not opposed to rational conviction." On the contrary, the task of the intellect "is to discover and expand the *justification* of belief, and thus convert otherwise blind belief into rational conviction" (pp. 13 ff.).

From this it will be seen that Professor Ladd is opposed to "the present tendency to . . . discredit the authority of reason in respect to the greater faiths. . . . The office of reflective thinking . . . must always . . . be that of revealing the truth or the falsity" of our beliefs. Since, however, the highest of our beliefs "are not the offspring of sense, . . . our primary aim can not reasonably be to prove them as the demonstrative or strictly inductive sciences need proof, but to 'purify and support' them" (pp. 28 ff.).

The chapter on "The So-Called 'Will to Believe'" brings out the fact that in the title of the book, *Should* is meant to imply moral obligation. It is my duty to believe what is reasonable. "The choice of the worthier, because more reasonable, among our beliefs" is a "moral kind of activity" (p. 51). In this limited sense, Professor Ladd gives his adherence to the doctrine of "the will to believe." I am not sure, however, that his position is unassailable. That, at least in many instances, it is our duty to consider the question of the reasonableness of our beliefs will doubtless be admitted. But when, as a result of our examination, we are prepared to pronounce one belief more reasonable than another, is it then within our choice to accept the one or the other? If I am convinced that *A* is more reasonable than *B*, I already accept *A*. If I do not feel quite convinced, but still *incline to think A* the more reasonable, again there seems to be no occasion for an act of will. What we have now is a case of probable judgment, of "trowing," as Professor Ladd elsewhere calls it. In short, I think that the influence of will upon belief is more indirect and more subtle than Professor Ladd represents it as being.

Another case that the author seems to regard as furnishing an opportunity for "the will to believe" is of even more doubtful character. In

the conduct of every-day life, he says, we are often called upon to choose between two opposed beliefs. "Shall this signature be believed to be genuine, or a forgery? Which of two diseases shall the physician believe to be indicated by the symptoms of the patient? . . . A choice must be made between two beliefs, and the evidence for either is far from being clear" (pp. 62 ff.). But is this true? There is indeed occasion here for choice, but it is choice between two courses of action, not between two beliefs. I need not decide whether the signature is genuine; I need decide only whether I shall honor the check. And if a physician is uncertain which of two diseases a patient has, what he must decide is which of two courses of treatment he shall follow. In cases like these, we are not called upon to choose what we shall believe, but only which of two equally doubtful propositions we shall select as a working hypothesis.

In both his arguments, then, it seems to me that Professor Ladd fails to support his contention: he has not shown that, as a matter of fact, we do sometimes will to believe; nor that, as a matter of morals, we ought sometimes to will to believe.

Following the discussion of "the will to believe" comes a chapter on "Lesser and Greater Beliefs." Those "beliefs and faiths are to be deemed the greater . . . which belong most essentially to the *Substance of the Self*; which have actually most weight and most value for promoting the permanent interests and contributing to the choicest developments of the personal life" (pp. 75 ff.). Among these greater beliefs we have, first of all, "the belief of the Self in Itself." Besides this, there are "the belief of the mind in its own capacity for knowledge" and various other fundamental intellectual beliefs which the author does not enumerate. Then there are the basic moral beliefs and the great beliefs of religion, the most important of which is "the faith in a Living God."

The author has said that in order to impose obligation upon a rational being a belief must be reasonable. In the chapter on "Rights and Obligations of Belief," he discusses the criterion of reasonableness. The three supreme tests are the amount of evidence for the belief, in fact and in sound inference from fact; the satisfaction that it gives to our highest aspirations; and the service that it renders to the needs of practical life. In connection with the first of these, he points out that the existence of the belief is itself an important piece of evidence, whose significance is often overlooked. By this he does not mean that the existence of the belief proves its validity, but simply that if a person is trying to discredit one of the fundamental beliefs of mankind, it is incumbent upon him to show how, upon his theory, the belief could have arisen.

The remaining chapters of the book—"Comforts and Rewards of Belief," "Beliefs, Scientific and Social," "The Faiths of Morality," and "The Faiths of Religion"—while they make no very important addition to the argument, carry out, in more detail, the general lines of thought that have been already indicated.

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The Negro Races: A Sociological Study. Volume II. JEROME DOWD.
New York: The Neale Publishing Company. 1914. Pp. 310.

One's adherence to the traditional belief as to the soul of goodness in things evil must be rudely shaken by a perusal of Dowd's sociological study of the African negro. From all conceivable points of view the book merits unreserved condemnation. It is not based on a thorough or even fair familiarity with the sources, first hand or secondary; the selection and arrangement of the material is arbitrary and misleading; without being in any sense a theoretical discussion, the work can not serve as a handbook, for descriptive data are in it inextricably intertwined with loosely fitting interpretations: geographical interpretations from Miss Semple, climatic interpretations from Huntington, that environmental magician, sociological interpretations from Sumner and Ellwood, psychological interpretations from McDougall. Most of the time the unwary reader could not tell where fact ends and fancy begins.

A minute analysis of the book seems unnecessary and would be tedious, but a glimpse of its uncritical character may be gleaned from a few quotations.

With reference to the Nubians we read that "the severe struggle against nature for existence develops a degree of courage and intelligence that renders the mind inhospitable to the grosser forms of superstition" (p. 28). Of their music we hear nothing, but "judging from the general desolation of the environment and the isolation of the group, the music should be of a melancholy strain" (p. 29). As to the Bahima, "the fact that nature is not here over-antagonistic and terrifying, and that the people have to cope with her and lead a somewhat strenuous life, has a tendency to develop reason and to curb the imagination" (p. 61). While the author seems to realize that in the present state of our knowledge all inference as to intelligence from brain weight and cranial capacity is hazardous, such inferences are nevertheless drawn, not merely once, as a general statement, but with reference to each group examined. Not satisfied with inferring from cranium to intelligence, the author, driven to extremes by the scarcity of craniological data among the Gallas, Somali, etc., adopts the opposite method of interpretation. We read: "the relation of brain weight to intelligence has not yet been scientifically established, but, if there is such a relation, the brain capacity of the Negro of this zone ought to be relatively high, corresponding to his superior intelligence" (p. 69). And, as if to discourage any possible criticism, the author remarks that "there seems to be a correspondence in all the African zones between the size and form of the brain and its activity." Edifying suggestions accompany the statements about Monbattu music, whose "chief musical instruments are the drum and trumpet. These instruments seem to predominate everywhere among people, who are violently excited by the fear instinct. . . . Stringed instruments, on the other hand, seem to be associated with people who are rather mildly agitated by fear, and live in a continuous mood of expansion and complaisance" (p. 113). With reference to the same Monbattu we are told that

"they are actuated strongly by the instinct of flight," and they also "have a strong instinct of curiosity, if we may judge from their fondness for hunting" (p. 120).

While the lay reader must be seriously warned against Dowd's highly incompetent work, the reading of it serves to arouse the anthropologist's instinct of humor, an instinct peculiarly indigenous to modern culture, for the reason, no doubt, that civilized man, far removed from the somber and horrifying aspects of virgin nature, finds himself surrounded by the congenial atmosphere of funny situations, funny people, and funny books.

A. A. GOLDENWEISER.

COLUMBIA UNIVERSITY.

JOURNALS AND NEW BOOKS

RIVISTA DI FILOSOFIA NEO-SCOLASTICA. April, 1916. *La Filosofia cristiana e la guerra* (pp. 105-130): GIOVANNI PEPE. - War, although primarily an evil, has salutary effects. It arises in the conscience of nations as a means of defending their rights and of restraining the violence of tyrants and oppressors. *Politica interna e politica estera di S. Tommaso d'Aquino* (pp. 131-139): AMATO MASNOVO. - St. Thomas assimilated the theories of other philosophers, especially of Aristotle, but these theories were by his action fecundated and simplified. *Immanenza o Trascendenza?* (pp. 140-158): LUIGI BORRIELLO. - Pantheism does not answer any of the great problems of philosophy. Consciousness is not eternal and it is not immanent, but transcendent. It is beyond consciousness that we must look for the ultimate cause of all that exists. *L'idealismo di Josiah Royce* (pp. 159-172): FRANCESCO OLGIATI. - The aim of Royce's philosophy is a transformation of absolute idealism, so that it can account for the world of facts and agree with the results of modern science. *La logica vivente di una conversione* (pp. 173-184): MARIO BRUSADELLI. - A history of the conversion of Cardinal Newman to catholicism. *Note e discussioni. Analisi d'opere.* Henri Bergson, *Il significato della guerra*: C. M. Francesco de Sarlo, *Filosofi del tempo nostro: ombre e figure*: U. A. PADOVANI. G. Cimbali, *Un'intesa scientifica internazionale per la dichiarazione dei diritti dei popoli*: E. FRANGI. *Notiziario*.

Macintosh, Douglas Clyde. *The Problem of Knowledge*. New York: The Macmillan Company. 1915. Pp. xviii + 503. \$2.50.

Sommer, G. *Geistige Veranlagung und Vererbung*. Aus Natur und Geisteswelt, Band 512. Leipzig und Berlin: Verlag von B. G. Teubner. 1916. Pp. 118. 1.25 M.

Trotter, W. *Instincts of the Herd in Peace and War*. New York: The Macmillan Company. 1916. Pp. 213. \$1.85.

Unold, J. *Ausgaben und Ziele des Menschenlebens*. Aus Natur und Geisteswelt, Band 12. Leipzig und Berlin: Verlag von B. G. Teubner. 1915. Pp. vii + 131. 1.25 M.

Whittaker, T. *The Theory of Abstract Ethics*. Cambridge: University Press. New York: G. P. Putnam's Sons. 1916. Pp. viii + 126. \$1.35.

NOTES AND NEWS

THE Aristotelian Society held the final meeting of the session on July 3, with Dr. Wildon Carr, president, in the chair. Professor J. Brough read a paper on "A Controversy on Import." The controversy in question was the symposium on the Import of Propositions in the Society's last session. The problem of Import is presented in a formula of Avicenna, "A proposition is the disclosure of a relation between two things, with truth or falsity." The "relation," "things," and "truth or falsity" had seemed to those who took part in the symposium the essential points of interest, but to the writer of the paper "disclosure" seemed the wonderful thing. How is it *a priori* possible that anyone should disclose anything? Logic in his view was a branch not of knowledge, but of culture. The un-fairest demand that can be made on logic is that it should be "logical" in the popular sense in which sciences and other argumentative achievements are logical, that is to say, are demonstrable or evidentiary. What is a fair demand is that it shall bring into consciousness the relation of any known fact to the aspirations of the knower, and shall be fit for that educative function. Logic should be described as the Liturgy of thought, rather than as a science or an art of thinking.

ON the initiative of the Royal Society a Board of Scientific Societies has been established in Great Britain to promote the cooperation of those interested in pure or applied science; to supply a means by which the scientific opinion of the country may, on matters relating to science, industry and education find effective expression; to take such action as may be necessary to promote the application of science to industries and to the service of the nation; and to discuss scientific questions in which international cooperation seems advisable. The board at present consists of representatives of twenty-seven scientific and technical societies.

THE department of psychology of the Johns Hopkins University will be divided temporarily. One part, under the direction of Professor J. B. Watson, will be housed in the Phipps Psychiatric Clinic, the other part will be removed to the new academic building at Homewood, and will be under the direction of Professor Knight Dunlap. In the planning and in building the Phipps Psychiatric Clinic provision was made for a psychological laboratory, but the laboratory was not established.

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

SENSATION AND PERCEPTION

I. THE GENETIC RELATIONSHIP

AS present-day psychology conceives it, the sensation is one, perhaps the most important, of the elementary conscious processes. It marks the limit, at least in one direction, to which we can carry our introspective analysis of the contents of consciousness. In the adult the sensation occurs always in combination. One never experiences sensations which are not structural elements in perceptions or other complexes. Colors, for example, are seen as the colors of or on things; the tones are elements in voices or other complex sounds, or, at least, they are heard as coming from a certain direction; the cutaneous sensations are the consistencies and temperatures of hard or soft, warm or cold, things; etc. It is possible, however, by introspection to analyze out the simple sensations which go to make up, say, our percept of a red paper disc, and to attend merely to the red color. By such means we can study the sensation itself and observe the characteristic changes it undergoes. As the psychologist is at pains to point out, the sensation thus isolated by attention has *ipso facto* undergone certain changes of attribute. As an elementary constituent of the complex percept, it is, he says, an artifact, an abstraction, whose characteristics in the limbo of inattention can only be assumed. Some of the difficulties of this conception I have discussed in a former article.¹

But the sensation is not regarded merely as an analytic element, but as a genetic element as well. While certain of the more careful analytic psychologists, like Professor Titchener, for example, are at pains to discriminate between the analytically simple and the genetically prior, and to point out that the elements reached by analytic introspection of adult consciousness are not to be taken as genetic elements, it is nevertheless true that the sensation does figure very widely as genetically primary. Experience of sensory qualities is put first in the development and is the prius from which the complex

¹ "The Psychological Element," *The Philosophical Review*, July, 1915.

percepts of things are derived. Thus we find even such a man as Baldwin saying: "The child begins in its prenatal and early post-natal experience with blank sensations and pleasure and pain with the motor adaptations to which they lead, passes into a stage of apprehension of objects with response to them by "suggestion," imitation, etc."² And again more significantly: "The study of children is generally the only means of testing the truth of our mental analyses. If we decide that a certain complex product is due to a union of simpler mental elements, then we may appeal to the proper period of child-life to see the union taking place . . . there is hardly a question of analysis now under debate which may not be tested by this method."³ The psychical structures as they exist in the adult have, it is held, been formed almost entirely in the course of his individual experience. So when the complex percept is pulled apart until the process of analysis can reach no further, it is assumed that the elementary constituents thus reached are older in the mental life than the percept which they formed. The success of introspection depends precisely on the completeness with which the work of experience is undone. In fact, it is largely from this that its difficulty arises. The student entering the laboratory must first of all learn to forget his acquired habits of "common sense." He must, in other words, abstract from all *meaning*. He must observe, not the whirling disc nor the chilly point of the steel, nor the prick of the needle, but this *red*, this *pressure*, this *pain*. In thus paring away all the meanings which experience has developed he is at the same time breaking down the complex percepts into their constituent elements, and—so it is assumed—putting himself as nearly as may be at an earlier stage of development. This difference is indeed admitted: that whereas the sensation to which introspective analysis leads is possessed of a maximum of clearness, being in the focus of a highly concentrated attention, the sensations of the infant float in a field which is in the lowest degree differentiated by attention. Still, it is thought, the sensations *are there* from the beginning, although they have not as yet been discriminated by attention. and out of them the perceptual complexes of mature life are organized. Even among psychologists who repudiate many of the doctrines of the so-called sensationalistic school, it is believed that cognitive experience, any experience of the meaningful, is later than mere sentience, the passive receptivity to the impressions of sense. It is indeed almost a universal belief that the child experiences colors, hears sounds, feels pressures, long before he sees balls, hears voices, or feels solid objects.

² "Mental Development," page 17.

³ *Ibid.*, page 15.

It is this doctrine of the genetic primacy of the sensation that I wish to criticize. The thesis to be presented in this paper is that sensations are not genetic elements, but are the products of the same individual development which yields perceptions. The child does not see colors, and can not see them, until, and in so far as, he has already learned to see objects. He does not hear tones until he has learned to hear voices and footsteps, nor feel pressures and muscular sensations until he has learned to feel hands and bottles and rattles. The one capacity develops *pari passu* and is correlative with the development of the other. That is to say, the stimulation of a differentiated end-organ yields a sensation of specific quality only if this sensation has already become a constituent element in perception. The development of meaning is one side, the generation of qualitative distinctness is the other side, of one and the same process of differentiation and integration. Thus if it be a falsification of early experience to describe it in terms of meaning, it is equally a falsification to describe it in terms of the existential, or given.

In the first place, it may be pointed out that this thesis is in harmony with the general facts of evolutionary development. The relatively homogeneous and undifferentiated regularly precede the heterogeneous and specialized. Consequently the assumption reasonable *a priori* is that the beginnings of conscious life possess a minimum of diversification and specialization. Now to suppose that the conscious life of the child begins with the sensing of an indefinite number of distinct visual, auditory, and olfactory qualities, together with those yielded by the cutaneous, muscle, and joint end-organs, is in flat contradiction with this presumption of initial homogeneity. It is claimed, of course, that all the organization of conscious life into complex and interdependent structures and functions takes place during the growth of the individual from infancy to maturity, and the process may continue far into old age. But no new structural elements are supposed to be generated in the process, which is conceived solely as a complication of those existing at the beginning. It is as if the body began its career with a full complement of bone-cells, muscle-cells, skin-cells, liver-cells, etc., and its development into an organism were brought about by the redistribution of these. The psychologist points out, to be sure, that the elementary sense-qualities are, for long, indiscriminated and unattended to; but the infants' experience is nevertheless supposed to contain them in kaleidoscopic confusion, very much as Empedocles's primitive world contained a jumble of arms, feet, ears, and hands. What meaning can be attached to the doctrine that color qualities which have never been discriminated are yet present as existentially distinct conscious ele-

ments, seems very doubtful. An indiscriminated difference would seem, indeed, to be indistinguishable from an indiscriminated identity. But however that may be, one might well argue that there was no more reason for supposing psychic life to begin with *disjecta membra* than for the belief that bodily life so begins. So far as we are to be guided by the general principles of organic evolution, the only reasonable assumption to make is that early conscious life is relatively amorphous, and does not possess anything so highly specialized as blues and reds, or high *c*'s and middle *a*'s. Instead of the gaze of the infant, as it wanders aimlessly around, encountering a parti-colored world, what it sees is more aptly to be described as "exciting," or "vaguely urgent," or "disquieting." As a matter of fact, however, the conscious content of a child is for long inexpressible in words at all; for words, being framed to denote the content of adult experience, are all hopelessly definite and discriminating. We can hope at most only vaguely to characterize, and not to express or describe it.

But if the generally accepted position is so widely at variance with the *a priori* probabilities, on what special grounds is it accepted? Surely, one would suppose, there must be strong and substantial arguments in its favor. If there are such arguments, however, they are not adduced by psychologists. The truth is that the doctrine in question seems to be one which, while tacitly accepted by almost every one so long as it is not challenged, is not actively defended by any one. But, though we do not find the doctrine actively defended, it is not difficult to discover the sources of its hold upon philosophical and psychological thought.

The first of these is the tradition of English empiricism and associationism,⁴ from which psychology in the last quarter-century has been struggling to free itself, not as yet with complete success.⁵ According to this tradition, analytic simplicity was frankly identified with genetic primacy, applied in political science, it led to individualism and the social contract theory; applied in ethics, it produced the hedonism of the eighteenth century, in which happiness was supposed to be built up out of atomic increments of pleasure; applied in logic, it resulted in the well-known theory that judgments come after concepts and are made out of them, while judgments in turn are put together to form syllogisms. But nowhere has the deceptive truth that "the simple precedes the complex" had wider application than

⁴ This tradition is not, it is true, confined to empiricism, but was the common possession of all the thought of the period. The social-contract theory, for example, was not originated by empiricists.

⁵ See article, "The Psychological Element."

in psychology itself. The formulated principle, that analytic simplicity is equivalent to genetic priority, would indeed be repudiated by most modern psychologists. But to deny the validity of a general principle, and to free oneself from the consequences of its former unquestioned acceptance, are, unfortunately, very different things.

It would, however, be unfair to modern psychology to suppose that its acceptance of the genetic priority of the sensation is wholly due to inertia in throwing off the yoke of pre-evolutionary dogmatism. There are certain very apparent reasons for supposing that the child has, either at birth or soon after, the capacity for receiving sensations; while it is almost equally apparent that he does not acquire the ability to see objects as significant wholes until later. No doubt it will be urged against what has already been said, that early experience in the race was admittedly relatively amorphous, since our early ancestors, like the simpler forms of animal life to-day, did not possess specialized sense-organs. The possible "structural" diversity of the content of the consciousness is determined by the diversity of the external stimuli to which the organism is a subject. If conscious life is present before birth, no doubt it is far more homogeneous and less differentiated than the consciousness of the infant after birth. But with a hypothetical pre-natal conscious life psychology has no concern. The child is equipped at birth with a full set of sense-organs, and if some of these, like the ear, do not function at birth, it is only a few weeks before they are all in operation.

The question, then, which we have to ask is: Do these sense-organs in their early functioning yield, or are they capable of yielding, specific sense-qualities, the qualitatively distinct sensations of the adult? In the adult the stimulation of an end-organ by its appropriate stimulus yields a sensation of specific quality. Moreover, it is incapable of yielding any but its own peculiar sensation-quality. Hence it is natural to conclude that if the corresponding end-organs in the child are capable of functioning, and if their excitation is transmitted to the cortex, there is experienced by the infant a sensation of similar specific quality to that experienced by the adult under similar conditions.

This assumption, in spite of its general acceptance, seems upon examination to be highly questionable. Appeal may be made to two sorts of evidence. First, there are the anatomical and physiological facts and, what is more important, the general psycho-physical theory in the light of which these facts are to be interpreted. Secondly, there is the psychological evidence of the child's behavior. Neither of these, as I shall attempt to show, supports the assumption.

A great advance in psycho-physical theory has taken place during the last quarter-century. This has been due to the growing realization by psychologists that the brain is, and must be regarded as, the organ of bodily *integration*, and not as the "seat of consciousness." This simple but profound insight has already led to momentous consequences, since the days when it was first proclaimed by Avenarius. The treatment of instinct and emotions, attention and cognition has been and is being revolutionized by it, and it has even given rise to a new school of psychologists, the "behaviorists." Nevertheless the traditional view of the sensation, the conscious "element," and its relation to perception has remained practically untouched; and this despite the application of the new theory to perception by Professor Dewey in his pregnant article, "The Reflex Arc Concept"⁶ nearly twenty years ago, and his recent development of the same theme in "Perception and Organic Action."⁷ That such a reinterpretation of the nature of perception must involve a corresponding reinterpretation of the nature of sensation is obvious. If perception is not to be adequately treated as a complex of associated sensations and sense-images, sensation is not to be adequately treated as an element, either genetic or analytic, of a conscious complex.⁸

⁶ *Psych. Rev.*, 1896.

⁷ This JOURNAL, Vol. IX, page 645.

⁸ The former article of Professor Dewey's is a protest against the view that a given stimulus is experienced as a determinate existent regardless of the response it calls out. Strictly speaking it is a "given stimulus" only in so far as it calls out a given response. "In other words, sensation as stimulus does not mean any particular psychical *existence*. It means simply a function, and will have its value shift according to the special work requiring to be done. . . . Generalized, sensation as stimulus is always that phase of activity requiring to be defined in order that a coordination may be completed. What the sensation will be in particular at a given time, therefore, will depend entirely upon the way in which the activity is being used. It has no fixed quality of its own. The search for the stimulus is the search for exact conditions of action; that is, for the state of things which decides how a beginning coordination should be completed" (*Op. cit.*, p. 368). It is important to note that Professor Dewey uses "sensation" as equivalent to "conscious stimulus" (*Cf. op. cit.*, p. 368). Whatever value or character the stimulus is experienced as having is "sensation." Thus "sensation" is relative. As used in the present discussion, the term corresponds to the "sensation" of analytic psychology. It signifies the irreducible elements of sense as they appear to the analytic attention of the psychologist—the hues of the color-pyramid, the pure tones, the colds, and pressures, and muscular sensations experienced under experimental conditions. As thus used, the term is not relative but absolute. The problem here discussed is, one might say, the converse of Professor Dewey's; for while he has shown that what conscious stimulus—what experienced content—follows the discharge of a given set of end-organs, depends on the response evoked, my inquiry is: what are the conditions under which the stimulation of a given end-organ yields the specific quality attributed to it by the doctrine of specific energy?

The realization of the fact that the brain is the integrative organ of the body involves the conclusion that conscious processes are not to be treated as correlates of the chemical discharge of cells in the cortex. So long as the brain was conceived primarily as the seat of consciousness, the organ by means of which, in some mysterious fashion, the incoming nervous excitation was transmuted into an impression of sense, one might speculate with Tyndall over the possible correlation between a "left-handed spiral motion" of atoms and the emotion of love. One might conceive the whole course of conscious experience of an individual as an accompaniment to a marvelously intricate dance of atoms, the complicated pattern of which was somehow a "correlate" if not a "cause" of the hopes and fears and thoughts of the individual, and the exact mechanical reproduction of which in space and time would reinstate the same sequence of conscious events. All such speculations and the familiar modes of thought which issued in them are no longer permissible. We no longer find it profitable to think of conscious processes as correlated with the molecular transformations in the gray substance of the cortex. Instead we conceive of certain modes of functioning of the nervous system as "conscious," and we determine as well as we may what these modes are by reference to the conscious behavior of the individual. If the destruction or injury of certain areas of the cortex brings about the loss of a certain definite body of conscious content—*e. g.*, as the lesion of the visual center brings about blindness, that is not because a certain group of *cells* is destroyed, but because a certain *functional center* is put out of commission. Leave the cells intact and sever their efferent connections, and you achieve the same result. In other words, it is only because that group of cells has developed the functional differentiation peculiar to it that we can suppose it capable of yielding the specific visual sensation qualities. We attribute the visual qualities to this "visual center" precisely because the discharge of the cells of this center is an integral and essential part of the nervous function of seeing. That they are discharged by the stimuli coming from the retinal end-organs is only a half, or a quarter, of the story, just as their location in the occipital lobes, facilitating certain nervous connections, is probably another quarter. The thing that counts is the peculiar specialization of function. There is no possible justification for stopping short in our physiological explanation with the discharge of the cells of the cortical centers, and yet it too often remains to the psychologist what the marriage altar is to the romantic novelist.

Suppose we turn now directly to the question whether the infant experiences sensations similar to those of the adult, as soon as his

sense-organs are capable of functioning. According to the generally accepted opinion of physiologists and genetic psychologists, this depends solely on whether the nervous excitation is capable of reaching the higher sensory centers. In the work of Miss Shinn, for example, which may be taken as fairly representative,⁹ we find her, when the psychological evidence of the experiencing of sensation-qualities is ambiguous, repeatedly falling back on the anatomical evidence, and accepting as conclusive the fact that the sensory fibers at the period in question are medullated to the cortical centers. She writes: "If the sensory impulses find functional conducting paths to the highest sensory centers, those of the cerebral cortex, we can have no reason to doubt that feelings of like quality with our own are associated with the central discharge."¹⁰ And again, referring to Flechsig's discovery of the importance of medullation: "According to his [Flechsig's] researches, there is every anatomical reason to suppose that a limited number of impulses can in fact penetrate to the highest sense centers, and that a number of the reflexes observed in the new-born infant are of cortical origin. Where we find the child, then, behaving as if it felt a sense-impression, and when it is known to be anatomically possible that this impression should reach the highest sense centers, we have twofold evidence, which gives us practical certainty of the presence of sensations like our own."¹¹

Now in opposition to this representative opinion I should suggest that we have reason to suppose that the stimulation of the cortical centers of the infant yields sense-qualities like our own, only in so far as these cortical areas are indeed functionally differentiated centers like our own, capable of mediating responses like our own. But such they notoriously are not. They possess at first a minimum of functional differentiation. Practically any sense center may yield from the start typical pleasant or unpleasant reactions, and each almost from the start calls out motor reactions in the organ stimulated. Thus the earliest response to light stimulus is a turning the head toward the source, and blinking. This is at first, perhaps, a reflex controlled by the sub-cortical centers; but the first cortical responses are of the same sort. In addition to these are the signs of

⁹ "Development of the Senses in the First Three Years of Childhood." *Univ. of Cal. Publ. in Educ.*, Vol. 4. I say "representative" without intending to imply that Miss Shinn's utterances on theoretical matters are to be regarded as authoritative. She is, indeed, recognized as an able investigator, and her observations are widely quoted with respect. The leaders in psychological theory are more guarded in their expressions, and it is harder to find them committing themselves in quotable passages. Miss Shinn represents the traditional doctrine implicitly accepted by the great body of psychologists.

¹⁰ *Op. cit.*, page 19.

¹¹ *Op. cit.*, page 20.

excitement—the aimless movements of arms and legs. But these are likely to follow the stimulation of any center. In other words, the discharge of the cortical sensory areas follows at first no well-marked paths of motor reaction. It is more likely to follow the short cut back to the region whence it came than any other; but otherwise it overflows in every possible direction, calling out motor reactions of the whole body. Moreover, the possible paths open to it are narrowly restricted. There are few associative connections with other higher centers open to it, for these develop late. If we compare the functioning of a sensory center of the infant with that of the corresponding area of the adult, the difference is enormous. Instead of a few possible avenues of escape, all leading directly to muscular response, there are a countless multitude of possible paths open. Moreover, the possibilities are not indifferent. There is no general spilling-over of the response, but an infinitely complicated system of responses, most of them highly indirect, and involving the coordinated action of many sensory centers. To suppose that this remarkable functional development, unparalleled in any other field of the organic world, can take place and leave the conscious content, mediated by the functioning of the center in question, untouched, is an enormous assumption. And yet that is what is implied in the accepted view. Thus Miss Shinn, summarizing the conclusions to be drawn from the evidence as to the child's sensibility at birth, writes: "These early experiences, then, unassociated with each other, unassociated with representations of their own former occurrence, are justly to be regarded as *pure sensations*, the simplest forms of consciousness we can conceive. In such experiences as these, there can be no consciousness of space, of externality or internality, of surrounding objects, or of self. Yet since each has its specific quality, these accumulating experiences, once associated, discriminated, remembered, and compared, afford the material for highly developed psychic life."¹² And again: "We start out, then, with a content of unconsciousness made up of a limited number of pure sensations, unrelated, unrecognized, unlocated, but varying distinctly in intensity, in affective quality, and in specific quality, . . . from the first a considerable mass of psychic material, awaiting only organization."¹³

¹² *Op. cit.*, page 47.

¹³ *Op. cit.*, page 49. This passage may well be contrasted with another which seems to me to express a truer insight. Miss Shinn has been criticizing the famous descriptive phrase of William James—"a blooming buzzing confusion," which, she says, "could apply only to a Minerva sprung fully formed from the forehead of Jove." She continues: "Rather does the babe drift softly in among phenomena, wrapped away from their impact in a dim cloud of unconsciousness, through which but the simplest and faintest gleams and

But if we accept the general principle—which indeed all psychologists do accept as a principle—that the conscious life of the individual is to be connected with the integrative *functioning* of the nervous system, and not with the chemical discharge of the molecules of gray matter, we no longer have the slightest ground for supposing that the stimulation of the so-called sensory centers of the infant yields sensations of the same specific quality as our own. We no longer have any ground for supposing—nay, the whole presumption is against our supposing—that the enormous differentiation of function which the sensory centers undergo during the months of infancy leaves unmodified the content mediated by them. There can be no “mass of material awaiting only organization.” Rather is it true that the very process by which that organization is brought about is the process by which the “material” is itself differentiated. The process of organization which issues in the perception of objects in space is the process by which the visual and tactual and auditory *qualities* of those objects come to consciousness; the process by which the sensations with their qualitative specificities are generated.

But what of the behavior of the child? Does the infant behave as if he experienced our specific sense-qualities? He undoubtedly responds, if not at birth, then soon after, to stimulations received through the special sense-organs. He sees and hears and feels in some way; but that he is experiencing visual and auditory and tactual sensations is more doubtful. What sort of evidence would be required to determine that an individual experiences, or is capable of experiencing, a certain sensory content? Simply and solely the fact that he discriminates, or is capable of discriminating such content in his behavior. Now the infant notoriously does not and can not by his behavior discriminate sensation *qualities*. His behavior, so far as it is more than reflex, consists in a few vague instinctive responses. Moreover his responses are at the beginning all of the sort called “type-reactions.” The range and variety of his behavior are far too limited to permit of any discrimination of sensation qualities.

In the early months of infancy it seems to be the so-called higher senses which play the greater part in the child's life. Taste and smell are apparently rudimentary. The child sucks at anything with which its lips come in contact, even contentedly sucking a strong solution of quinine. Smells have been found to call out the same echoes make their way to him. Then month after month the multiplex vision from without clears itself from the background of cloud, bit by bit, everything grouped and ordered for him in the very process of coming to his consciousness—a wonder and a joy to him, and the most beautiful of all unfoldings to see” (pages 144–145).

reflex sucking response if the stimulus is mild; if stronger, grimaces and choking, which may well be reflex, also, and in any case are no evidence of the experiencing of specific smell qualities.

As to dermal sensibility, reactions are aroused from the earliest days by contact, heat, cold, and what to an adult would be pain stimuli. But these are not discriminatory responses. So far as they differ at all from each other, it seems to be only by way of pleasantness and unpleasantness. I learn from Miss Shinn that in Genzmer's experiments with infants two or three days old the response to needle pricks was not a characteristic pain reaction, but similar to that following contact stimuli, although the slower physiological time and the difference in location of the sensitive spots were evidence that it was the pain end-organs which were stimulated. "It would seem, then," comments Miss Shinn, "that the paths which belong specifically to pain conductions can be permeable, and yet no specific feeling of pain be excited in the subject. The conjecture follows that in this case the excitations reach only the primary centers, and that it is only in the highest centers that pain impressions and contact impressions are differentiated. Yet characteristic pain reactions can not always be regarded as evidence that the higher centers are involved, for the acephalous infant mentioned above, and a similar one examined by Flechsig, both reacted (very feebly) with cries when the skin was slapped or pinched. The facial expression of discomfort and the generally disturbed behavior is safer evidence that pain is really experienced than the mere cry. Even these are, after all, signs of disagreeable feeling in general, not of pain specifically. Still, knowing how much more restricted are the paths of motor expression than those of sensory impression, and how invariable in later life is the rule that excitations of specialized nerve-ends never produce any but the special corresponding sensations, we may reasonably conclude that when a stimulus calculated to excite the nerves of pain is applied, and general signs of discomfort follow, the form of discomfort experienced is really pain."¹⁴ This is a typical case of falling back for support upon physiological doctrine. And yet the only possible evidence available in support of physiological doctrine is behavior. The young infant is incapable of expressing any but "general discomfort." So far as the evidence from behavior goes, that is all he is capable of feeling.

Visual stimulation brings out responses almost from the first. The early responses, as is usually the case, involve movements of the organ or part stimulated. The child, at first apparently by a reflex adjustment, although soon by central control, turns its head toward

¹⁴ *Op. cit.*, page 35.

the lighted part of the room. Later the light, or bright objects and surfaces. In response there is a typical response of pleasures of pleasantness and unpleasantness are accompaniments of the more specific response to any stimulus of the organ in question bring about a vague local response. The only sort of discrimination department is for long what one may call a "strong reaction." Some stimuli, that is, call out a strong reaction together with a more marked pleasant or unpleasant response. Bright and glittering objects, or surfaces, and shade contrasts are gazed at longer and more often than out marked signs of pleasurable excitement.

In regard to color sensitivity proper, a number of investigations have been made, notably by B. F. Skinner, Chas. S. Myers, Helen Thompson Woolley, and others. The conclusions drawn by these investigators on the whole rest upon assumptions of fundamental theoretical principles. The experiments of all of these psychologists, with the exception of those of Chas. S. Myers, were made with infants in the grasping reaction. The conclusions drawn were based on the number of responses, etc., of various colors and presented in various orders after.

In Mrs. Woolley's tests, for example, preferences for colors of similar texture, shape, and brightness were tested in a series of 10-12 choices, half in each of two hands, for preference for position or hand used. It was found that infants decidedly preferred to blue, green, and yellow, though no appreciable preference was shown for red. Yellow, when paired with blue, green, and red, however, stood even with blue, behind black, white, and gray. Mrs. Woolley concludes that infants were perceived as colors, but that it was not clear whether they were perceived as a color. That is, what was shown to be preferred, in a more or less marked degree, was the response to colors to those of certain others. Now is this a response to experienced sensations of the same species? What would have done? It seems to me at least that the doubtful are the conclusions reached by this method is, of course, not applicable to children under the fifth month, since before that time the grasping reaction is not sufficiently developed. Valentine wished to

¹⁵ *British Journal of Psych.*, Vol. 6, page 363.

made the attempt with an infant of three months by observing the relative lengths of time wools of different colors were gazed at. Two wools of different colors were presented side by side against a dark gray coat, slowly drawn apart 8 inches, and left motionless. A record was kept of the number of seconds the child gazed at either wool, or at neither, for a period of two minutes from the time the child first looked at either. Then a rest interval was allowed, after which a new test was made, care being taken to eliminate any preference of position by interchanging the colors. The order of preference of the different colors (yellow, white, pink, red, brown, black, green, blue, violet) was determined by percentages figured by comparing the total number of seconds each color was gazed at, with the total number of seconds it might have been gazed at. Valentine found that yellow stood highest, with white and pink close second and third; red, brown, black, green, and blue next, in order given, while violet was markedly below all the others. These preferences were not, Valentine argues, based wholly on brightness, since yellow stood higher than white, and red higher than blue or green, and much higher than violet, although of the same brightness with them. He draws the conclusion, therefore, that sensations of red, yellow, green, blue, and brown were all experienced by the infant. But surely this is scarcely warranted by the evidence. The response of gazing is of the simplest sort, comparable to a mere tropism, and the fact that certain colors are more effective stimuli to this response than others is no indication of *quality* of sensation. The phenomena would seem rather to be allied to the known greater physiological influence of the so-called "warm" colors, notably red, discovered by Féré.¹⁶

If the evidence from behavior is to be taken on its own merits, we can attribute a qualitative difference to two stimuli only when responses are correspondingly different in kind. Mere "preferential discrimination" is not sufficient. It is only preconceived psychophysical theory which gives one any reason whatsoever for supposing otherwise.

The tests used with an older child or an adult for color-blindness all involve a *sorting* of the colored materials, an *arrangement* of them in serial order. This, of course, implies the perception of colors as like and different, and as more or less like and different. Each tint or shade brings out a response appropriate to the specific character of the stimulus and characteristically different from the response demanded by every other tint and shade. The responses themselves form a series of graduated acts commensurate with the series of stimuli. This is a sort of behavior of an altogether different order from the merely "preferential discrimination" shown by the gazing or

¹⁶ Referred to by Valentine, *op. cit.*, page 375.

grasping infant; and it is a sort of behavior of which the infant is utterly incapable. To suppose that in spite of this incapacity, the infant receives sensations of the same specific quality as does the older child who places orange between red and yellow, and purple between red and blue, seems to be an unwarranted and wholly unnecessary assumption. What makes it plausible is that it is difficult for us to imagine why the yellow and red are preferred to other colors (as they usually are), if they are not seen as "red" and "yellow." When brightness and saturation differences are ruled out, what other difference between a bit of red and a bit of blue paper exists to make the one more attractive to the baby than the other? But this question rests, it seems to me, on a false conception of the whole matter. It must, of course, remain unimaginable to us how the baby sees the red and the blue, for we have no terms in which to imagine it. Perhaps, however, we can imagine what it would be like to see things as simply and vaguely "red" and "blue," and not as scarlet and cardinal and crimson, nor as turquoise and ultra-marine and sapphire, for many of us habitually see the hues and tints of things thus loosely, and all of us do frequently. We may be vaguely aware of one wall-paper as pleasing and another as displeasing, without having any idea of what hues the papers are. We may literally never have *seen* the hues which we now on examination see them to have. Now the infant's color consciousness in its early stages may well be analogous to this. To say that he first sees all objects as *gray*, and later on begins to see washed-out reds and yellows is, I believe, a falsification. It is carrying over the terms descriptive of the highly differentiated structural elements of a late stage in evolution and applying them to the structures of an earlier and simpler type.¹⁷

Of qualitative diversity and specificity such as is experienced by the adult, there is, so far as I can see, no positive evidence given by the behavior of the child during the early months of infancy. The earliest discriminations in response would seem to be between what is pleasant and unpleasant. Along with this goes from the first a localization of response, the earliest reactions being movements of

¹⁷ It is worth while to quote in this connection a paragraph from Chas. S. Myers (*Br. Jr. of Psych.*, Vol. 2, page 360): "Surely it is more likely that vibrations of whatever frequency, so long as they affect the infant's retina and cochlea at all, at first evoke merely sensations of light and sound, and that from this primary experience of light the colored and colorless series of sensations become gradually and simultaneously differentiated, while from the primary experience of sound tones of various pitch and noises are similarly differentiated from one another. It seems to me most improbable that, in the development of the individual or of the race, sensations of one color region or of one tone region develop before those of other regions. I look on the process of sensory development as a gradual unfolding, a gradual appearance of diversity among experiences which earlier seemed identical."

the organ or part stimulated, often to facilitate or prevent further stimulation: as the turning the head and eyes toward the light, the attitude of listening, the sucking at whatever touches lips or mouth, the clasping which follows a touch on the palms, etc. From the first there seems good evidence that visual, auditory, and dermal stimuli are experienced as different from each other in a way which might be loosely described as difference in quality. That dermal stimuli of contact, heat, cold, and pain are experienced as qualitatively distinct seems more doubtful. One might venture the opinion that "local sign" is developed earlier than differences in specific quality.

In conclusion I wish to say a few words as to the positive character of the early experience of the baby. It is often, perhaps usually, believed that it is a passive experience, that the baby is ushered into a world of kaleidoscopic confusion, a multitude of fleeting impressions or presentations, which in William James's phrase "come and are and have their being," and which only slowly and gradually acquire order and significance. So far from this being true, I believe one might rather say that the baby's world contains neither confusion nor separate impressions which can be "presented" or have "being." It is rather a world of imperative urgencies and impulses, so immediate that the presentation is lost in the effort of looking or grasping or sucking or shrinking, as with us the quality of the itch is lost in the urgency to scratch, or the quality of intense pain in the shrinking from its intolerable unpleasantness. Only—and this is an enormous difference—we can refrain from scratching, and can to some extent conceal our suffering, whereas for the baby to feel is to suck. Just as there is no possibility of inhibition and choice of response, so there is no experienced "what" of the stimulus. What it is and what it demands are so telescoped together that both are lost, and there is an experience which is neither sentient nor noëtic, but something simpler than either. The conception of "pure sentience" is one gained by abstracting an aspect of our own experience. For us, the sensuous world has lost, to a large extent, its immediate urgencies; and so, from the vantage-ground of our very indifference, we can in passive contemplation savor its qualities. But for the baby the conditions for this are all wanting. Because the sights and sounds and smells are experienced only to be immediately responded to, because they permit no choice of response, they have acquired no true significance and no specific character as presentations.

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(To be continued)

HELLENIC CIVILIZATION¹

SINCE the appearance in 1870 of Bishop Stubbs's "Select Charters," our pioneer "source-book," scholars have generally recognized the high value of source collections and translations for historical study. If the "institutional" and the "economic" interpretations of history have each in turn sharpened the vision of research, bringing to light much neglected or overlooked evidence of the life of past generations, the present eager striving for a more intensive sociological interpretation promises even more precious fruit. Under the new social inspiration the study of antiquity is gaining a deeper meaning. In particular the exploration of the remains of the Grecian and Roman civilization is receiving a novel impulse. Historians are rereading their original sources to good purpose. Some recent scholastic events seem to warrant the belief that the study of the "classics" is about to yield its richest harvest: for the vision of the new humanism is so much keener than the vision of the old humanism. It may yet be possible to reconstruct the actual social life of Italic and Hellenic humanity.

"The Hellenic Civilization"—the first volume published in the projected series of "Records of Civilization"—is an earnest of that event. In several respects it is a notable achievement. Editorially, the workmanship is of first-rate quality. To produce an up-to-date source-book in this field has required profound scholarship and rare critical power. Typical passages had to be selected from an immense mass of materials, much of which has been accumulated by recent archeological research. The bibliographies, the critical notes, and the introductory chapter on the sources of Hellenic history are all admirable; yet it is the character of the selections actually made which now chiefly challenges our attention. These extracts cover a wide range of topics marking the progress of culture from the Minoan age to the early centuries of the Christian era. It is significant of the thoroughly modern viewpoint of Dr. Botsford and his colleagues that practically the whole material lies in the broad field of the social sciences. The student of religion, jurisprudence, politics, economics, or sociology will here find aid; while often he may be surprised to discover that questions, which perchance he fancies have arisen only under present-day conditions, were familiar to Greek thinkers thousands of years ago. Even in the Minoan age (3000-

¹ "Hellenic Civilization." Edited by G. W. Botsford and E. G. Sihler, with Contributions from William L. Westermann, Charles J. Ogden and Others. New York: Columbia University Press, 1915. In "Records of Civilization: Sources and Studies." Edited by James T. Shotwell in collaboration with other scholars of Columbia University and Union Theological Seminary.

1200 B.C.) attention is called to survivals of social and political conditions. Some illustration of the value of this source-book for the study of society may, perhaps, prove enlightening.

In the outset, "it is a remarkable fact," as Dr. Botsford points out, "that twenty-five hundred years before the dawn of anthropology a Greek dramatist should come so near the truth regarding the origin of civilization." Thus Æschylus causes Prometheus—friend of mankind and mythical ancestor of the Hellenic race—to explain the evolution of culture under his guidance:

"They (mortals) in the first place, though seeing, saw to no purpose, hearing, they did not understand; but like the forms of dreams, during all that long time they did everything in a confused and random way, and knew not brick-built houses turned to the sun, nor the craft of carpentry. But they used to dwell in holes made in the earth, like the tiny ants in the sunless recesses of caves. Further, they had no sign either of winter or of flowery spring, or of fruitful summer, to rely upon, but they used to do everything without judgment, till at length I showed them the risings of the stars and their laboriously determined settings. Moreover, numbers, the best of inventions, I devised for them, and the combining of letters, at once the origin of literature, and the means of remembering every event. I was the first, too, to join together under the yoke the animals that served them," to find "out for them the sea-traversing canvas-winged cars to convey mariners," as also medicines, "ways of divination," and "those great benefits to man which lie hidden under the earth,—copper, iron, silver, and gold."

The collection affords many a vivid glimpse of commercial, industrial, and economic conditions. "In ancient Greece," according to Botsford, "the only banks which could in any sense be described as public were the temples"; while "private banks were a development from the money-changer's trade, which lay in the hands of slaves and freedmen." The great speech of Demosthenes in "Behalf of Phormion" shows that banking operations in Athens were very similar to those of our day. The method "was to receive deposits on interest, which were then invested on security of land or capital; letters of credit were issued; and sometimes the banker engaged personally in commercial transactions." Banking stock claimed by the plaintiff, Apollodorus, is mentioned in the speech of Demosthenes given in the text.

In view of the extensive use of moratoria by England for the steadying of exchange at the beginning of the present European war, the moratorium of about 147 B.C., declared for a different purpose by Critoläus, general of the Achæan League—who "was determined to bring on a war with Rome"—may have the spice of timely interest:

"Critoläus . . . sent round orders to the magistrates not to expect money from debtors, nor to receive prisoners arrested for debt, and to cause loans on pledge [real estate mortgage] to be held over until the war should be decided. By this kind of appeal to the interests of the vulgar everything he said was received with confidence; and the common people were ready to obey any order he gave, incapable as they were of taking thought for the future, but caught by the bait of immediate indulgence and relief."

It is clear from the "Letters" of Alciphron, written about 200 A.D. and referring to conditions in the fourth century B.C., that the "loan-shark" was busy in ancient Hellas:

"The usurers in the city, kind friend, are a great nuisance. I do not know what was the matter with me when I ought to have gone to you or some other of my country neighbors, at the time I was in need of money for purchasing a farm at Colonus. On that occasion a man of the city went with me to the house of Byrtius to introduce me to him. There I found an old man looking wrinkled and with brows contracted, holding in his hand an antique paper, rotted by time and half-eaten by moths and bugs. Forthwith he spoke to me in brusquest fashion, as though he considered talking a loss of time. But when my voucher said I wanted money, he asked how many talents. Then when I expressed surprise at his mention of so large a sum, he forthwith spat, and showed ill temper. Nevertheless he gave the money, demanded a note, required a heavy interest on the principal, and placed a mortgage on my house. A great nuisance indeed are these men who reckon with pebbles and crooked fingers. Never, ye spirits who watch over the farmers, never may it again be my lot to behold a wolf or a usurer!"

An oration of Lysias shows that the most daring "plunger" of the modern board of trade "has nothing on" his Athenian prototype who was quite capable of engineering a "corner on grain," although death was the prescribed legal penalty for so doing:

"For when you happen to be most in want of grain, they grab it and are unwilling to sell, and you may be well satisfied to buy from them at any price whatever and take your leave of them, so that sometimes when there is peace we are reduced to a state of siege by them."

It appears from Plato's "Protagoras" that the "muck-maker" in Greece produced his natural complement the "muck-raker." The "knocker" was detested as much by the ancient as he is by the modern "town-booster":

"Bad men, when their parents or country have any defects, look on them with malignant joy, and find fault with them and expose and

denounce them to others, under the idea that the rest of mankind will be less likely to take themselves to task and accuse them of neglect; and they blame their defects far more than they deserve, in order that the odium which is necessarily incurred by them may be increased; but the good man dissembles his feelings, and constrains himself to praise them."

Many extracts are helpful in studying the family life of the Greeks. The dialogue between Socrates and Ischomachus, taken from Xenophon's "Economicus," gives a realistic picture of the place of the wife in the management of the household. "Some thinkers of the age," remarks Professor Sihler, "were of the opinion that there were no differences between women and men, that women should have the same education as men, and should follow the same occupations, even politics and war." On the contrary, "Xenophon was convinced that women, though the equals of men, were in important respects essentially different, and that there should accordingly be a division of labor—that the sphere of woman or of man was only a hemisphere." Marriage should be an even partnership for all life:

"Did it ever strike you to consider, dear wife," says Ischomachus, "what led me to choose you as my wife among all women, and your parents to entrust you to me of all men?" In each case, it was to discover the "best partner of house and children. . . . If at some future time God grant us to have children born to us, we will take counsel together how best to bring them up, for that too will be a common interest, and a common blessing, if happily they shall live to fight our battles and we find in them hereafter support and succor when ourselves are old. But at present there is our house here, which belongs alike to both. It is common property, for all that I possess goes by my will into the common fund, and in the same way all that you deposited was placed by you to the common fund. We need not stop to calculate in figures which of us contributed most, but rather let us lay to heart this fact that whichever of us proves the better partner, he or she at once contributes what is most worth having." Ischomachus tells Socrates that his "wife is quite capable of managing our domestic affairs without my aid"; but she was not well skilled to perform her household duties when she came to him. "What proficiency was she likely to bring with her, when she was not quite fifteen at the time she wedded me, and during the whole period of her life had been most carefully brought up to see and hear as little as possible, and to ask the fewest questions?" Though, "as regards control of appetite and self-indulgence, she had received the soundest education, and that I take to be the most important matter in the bringing up of man or woman." Accordingly after marriage Ischomachus became his wife's teacher in home economics.

Greek husbands did not all accept Xenophon's ideal of wifehood and Greek wives were not all so docile as was the "partner" of Ischomachus, if we may trust these lines from Alexis of Thuri (300-290 B.C.) :

"Oh wretched are we husbands, who have sold
 All liberty of life, all luxury,
 And live as slaves of women, not as freemen.
 We say we have a dowry; do we not
 Endure the penalty, full of female bile,
 Compared to which the bile of man's pure honey;
 For men, though injured, pardon; but the women
 First injure us and then reproach us more.
 They rule those whom they should not; those they should
 They constantly neglect. They falsely swear;
 They have no single hardship, no disease;
 And yet they are complaining without end."

Usually the father gave his daughter in marriage and provided her with a dowry. "The grant of a dowry was legally advantageous to a wife and to her children in that it served as evidence of a legitimate marriage. As she could recover it in case of separation," continues Botsford, "it tended to make her marriage more stable. Although a dowerless wife was in these two respects placed at a disadvantage, it was considered generous and patriotic in a citizen to marry a poor dowerless girl." This idealism is illustrated by an interesting extract from the "Orations" of Lysias, which closes with this sentence :

"Well then, gentlemen of the jury, in case of a man who himself married a portionless wife and gave great dowries to his two daughters, but advised his son to take a wife with a small portion, is it not reasonable to believe in regard to him that it was not for the sake of money that he became a kinsman of these persons?"

That the Greek maiden sometimes rebelled against the choice of a bridegroom by her father, is disclosed by a passage from Aliciphron, where Glaucippe—who had been smitten by the charms of a youth whom she had seen at the Oschophoria, a "festival in which young men dressed in women's clothes marched in procession carrying vine branches loaded with grapes"—thus appeals to Charope, her mother :

"I can no longer contain myself, mother, nor can I endure to marry the young man from Methymna, the pilot's son to whom my father betrothed me, since I saw the city youth at the Oschophoria, when you sent me to the city at the time of that festival. He is beautiful, O beautiful, mother, and most sweet. He wears his hair in curls more charming than sea-moss; his smiles are fairer than the quiet sea, and the blue of his eyes is like the ocean when first lit up

by the sun's rays. His whole countenance—one would say that the Graces, after bathing in the fount Argaphia, had left Orchomenus and were dancing in his cheeks. His lips he has tinged with roses taken from the bosom of Aphrodite. Either I must marry him, or in imitation of the Lesbian Sappho, will throw myself from the promontory, not of Leucas, but of Peiræus."

To which Charope made answer:

"You are mad, daughter dear, and entirely beside yourself. You need a dose of hellebore, not the ordinary kind, but the sort that comes from Phocian Anticyra; for you ought to feel a maidenly shame, but have cast off all modesty. Compose yourself and thrust from your mind this mischief. For if your father should learn a word of this, he would without a moment's thought or hesitation throw you as food to the sea monsters."

It may perhaps be too much to say that there was a feminist "movement" in ancient Hellas. Yet it is certain that various aspects of the "woman question" were already familiar to Greek thinkers. High-minded women were not content with the inferior position of the wife in the family; and they resented the husband's practically exclusive right of divorce. Thus exclaims Euripides's *Medeia*, whose husband, Jason, had repudiated her and taken another wife:

"Of all things that have life and sense we women are the most hapless creatures; first must we buy a husband at an exorbitant price, and o'er ourselves a tyrant set which is an evil worse than the first; and herein lies a most important issue, whether our choice be good or bad. For divorce is discreditable to women, nor can we disown our lords. Next must the wife, coming as she does to ways and customs new, since she hath not learned the lesson in her home, have a diviner's eye to see how best to treat the partner of her life. If haply we perform these tasks with thoroughness and tact, and the husband live with us, without resenting the yoke, our life is a happy one; if not, 'twere best to die."

Socrates, in Plato's *"Republic,"* rejects the notion, still held by many in our day, that the division of social work should be determined by nature's sex-division of function; that is, by motherhood and fatherhood; while he champions the political capacity of woman. In a tone which would delight the author of *"Women and Economics,"* he raises and negatives the following question:

"Are dogs divided into hes and shes, or do they both share equally in hunting and in keeping watch and in the other duties of dogs? Or do we entrust to the males the entire and exclusive care of the flocks, while we leave the females at home, under the idea that the

bearing and suckling of their puppies is labor enough for them. . . . The only difference between them is that the males are stronger and the females weaker. . . . Then if women are to have the same duties as men, they must have the same nurture and education." It is right to maintain the "general inferiority of the female sex: although many women are in many things superior to many men." So "there is no special faculty of administration in a state which a woman has because she is a woman, or which a man has by virtue of his sex, but the gifts of nature are alike diffused in both; all the pursuits of men are the pursuits of women also, but in all of them a woman is inferior to a man."

At Athens, as early as the close of the fifth century some members of the intellectual classes were in favor of granting the suffrage to women. The "Lysistrata" of Aristophanes, says the editor, "is interesting as the first-known piece of literature which treats of 'woman's rights.' Aristophanes proposes, between jest and earnest, that the women of Athens should assume the reins of government, make peace with the Peloponnesians, join the allies on equal terms with the Athenians in 'one mighty political aggregate,' and improve the administration in various ways." Lysistrata is surely the pioneer feminist and her speeches have a strangely familiar sound. The delightful dialogue in which she shows how women would socialize diplomacy and purify politics is too long for quotation here.

The modern pacifist will find in this collection materials to sustain his views. We are coming to realize that war and militarism, like all social products, are the result of choice and habit; and, like many other social products, they are due to misselection of the means to satisfy human cravings, whether or not such cravings are welfare needs. The war-struggle theory of organic and social progress, of "survival of the fittest," is a sinister fallacy, a perverse blunder, for which both the biologist and sociologist are to blame. We are questioning the universality and the importance of the so-called "instinct of male pugnacity," and are laying the accent more on the "peaceful inheritance of our species." War is not even a universally acquired human habit. It must be charged mainly to the selfish motives of a few exploiters, the war-lords; not to the spontaneous desires of the masses of men, much less the masses of women. This idea, too, was known to the Greeks. Speaking of wars among the Hellenes, Plato, in his "Republic," wisely makes Socrates say:

"They know that the guilt of war is always confined to few persons and that the many are their friends."

The present European conflict with frightful emphasis is repeating the great lesson of history; for war, the capital mistake of a

male-made world, is always and everywhere the scourge of womanhood. In every war the heaviest cost falls on woman, the race-bearer and the race-conserver. The fighting soldier pays less. Woman endures harder things than dying in battle. To this fact Euripides's *Medeia* bears witness:

"With their sorry reasoning," she exclaims, "they say we live secure at home while they are at the wars; for I would gladly take my stand in battle array three times o'er than once give birth."

Possibly the examples here presented may suggest the richness of this source material for an intensive study of the social life of Hellas. Completed in the same spirit, the series of volumes as planned will much advance our knowledge of the things worth while in the civilizations which have preceded our own.

GEORGE ELLIOTT HOWARD

THE UNIVERSITY OF NEBRASKA.

REVIEWS AND ABSTRACTS OF LITERATURE

Elementary Logic. ALFRED SIDGWICK. Cambridge: Cambridge University Press. 1914. Pp. x + 250.

Mr. Sidgwick regards traditional logic as a word-game that is played with syllogisms. The skilful player must be entirely familiar with the rules of the game and with the technicalities they involve. Even in the class-room where logic survives as "sober doctrine" it is best to treat it as a game, for then "it can be easily mastered and as easily forgotten" (p. 2). The main interest of Mr. Sidgwick's book lies, however, not in his treatment of the old system of logic as "a carefully limited subject to get up for an elementary examination" (p. viii), remarkable though this be for its simplicity, but in his account, for beginners, of a new system as "a free study of some of the chief risks of error in reasoning" (p. viii).

The fundamental assumption made by the old logic is that it is possible to separate form from matter in reasoning. Letter symbols, "counters devoid of meaning," are used for expressing the various syllogistic-forms, this device helping to conceal the absurdities which often arise when we try to find words to fit them. In fact the old system of logic is so excessively abstract that its whole tendency is towards viewing reasoning as a mechanical process. Mr. Sidgwick is well aware that, viewed as a theory of reasoning, it still has its devotees. Indeed, he revels in the fact that "there are people living even to-day to whom the conception of logic as a game seems little short of sacrilege" (p. 1). The trouble lies in the fact that such people do not realize that traditional logic is a survival from the days when classes of all kinds were regarded as unalterable facts of nature. Mr. Sidgwick, on the other hand, holds the "troublesome modern notion" that "classes are only our human way of grouping things to suit our pur-

poses, which are liable to change and vary" (p. 6). Modern science is remote from the conceptions in which logic has its roots. "Not petrified perfection, but gradually improving imperfection is our present ideal" (p. 112). We are no longer so interested in classes that are already recognized and in their extensive relation to one another. We want to know about things, how they may be produced and avoided, about the causes making them what they are.

But our thoughts about things can only be examined in the form of statements, and all statements are descriptive and hence incomplete. For beyond the completest account of a fact in general terms there lies some individual difference. Logic has not provided effective safeguards against this pervasive risk of ambiguity; nor can it do so, while it holds that propositions are formed by joining together terms, each of which has a meaning independent of the proposition in which it occurs. Of course Mr. Sidgwick recognizes that many terms have stable meanings which seldom present any difficulty. All meaning, however, depends on agreement and varies with our varying purposes. The meaning of any fact is most simply stated by making use of a general rule. So the chief problem of modern thought is the interpretation of general rules and their application to particular facts. The structure of reasoning is always syllogistic, for all syllogizing consists in applying general rules to particular cases. If we have no error of fact in the rule used, nor in the nature of the case in question, and yet have lack of connection between the two, this is due to ambiguity. No part of reasoning is safe against this ubiquitous source of error. To guard against it is the chief business of modern logic.

Mr. Sidgwick allows traditional logic to retain exclusive rights to its dignified capital letter. Its intentions are good, but its creation of a region in which it is infallible removes from its jurisdiction all the most dangerous errors to which reasoning is prone. As an active force "logic hardly exists now, except in some of the backwaters of philosophy, where men . . . make efforts to soar above the truth that is merely practical, and are rewarded by reaching results that are very much the reverse" (p. 153). Modern logic, on the other hand, recognizes thought to be purposive throughout, and its central subject is "the risks of reasoning, so far as they admit of being recognized and understood" (p. 170). It can not take the place of science. It can only help us to get a clear view of the problem at issue and to be watchfully on guard against ambiguity of the middle term. The new logic is more modest than the old, but it involves greater expense of thought and more flexibility of mind.

Mr. Sidgwick admits one weak point. Modern logic presents greater difficulties to the examiner, and perhaps as yet for the teacher. In it technicalities are subordinate; their names are less important than the uses to which they may be put! The doctrines of modern logic are simply different applications of its few main principles. However this may be, it seems certain that the study of logic as here conceived would stimulate interest to a far greater extent than is done by the usual college course. Most students of elementary logic make the same remark: "What is the

use of learning all these names? The only interesting part of logic is the fallacies." Is not this an indication of the need of just such reforms as Mr. Sidgwick suggests?

UNA BERNARD SAIT.

The Philosophy of Change. H. WILDON CARR. London: Macmillan and Company, 1914. Pp. xii-216.

Dr. Carr espouses M. Bergson's philosophy and presents an account of its principles in this book. Admirers of M. Bergson's philosophy will, if they read Dr. Carr's book, admire that as well. Not, however, that we assert an invariable proportion between the admiration of M. Bergson's philosophy as it may exist in particular minds, and the corresponding approval that might be excited in each such mind by the perusal of Dr. Carr's book. For although Dr. Carr, as we take it, has been true to the dominant spirit of M. Bergson's writings, and although his rendering of M. Bergson's conceptions seems in its essence correct, nevertheless (inevitably) the reduction of an elaborate doctrine to a fraction of its original compass would involve the omission of certain of that doctrine's specific marks. And so, in this version, M. Bergson's doctrine strikes one as rather more uniform, even, systematic, and definitely coherent, than it appeared in the volumes given to the public by M. Bergson himself. Change, taken as the explanation and the source of all things; and intuition, taken as the turning of the mind from its practical bent; these tenets, the expressly unifying tenets of M. Bergson's philosophy, come out very clearly—in fact they emerge quite starkly—in Dr. Carr's work. Those intent chiefly on the metaphysical perspectives of M. Bergson's work, therefore, comprising without doubt the majority of his readers, would find a satisfaction disproportionately considerable in reading this book. Those, on the other hand, who esteem M. Bergson's philosophy as an aggregate of parts more than they admire it for such of its aspects as endow it with whatever of explicit integrity it may chance to possess would, very likely, as they read Dr. Carr, discover the notion rising to a higher point in their minds than ever that in the rôle of a resolver of all of the problems of philosophy by the use of a couple of principles M. Bergson has been not only unoriginal, but conceivably, indeed, not unwittingly so. When he writes for himself M. Bergson produces the impression of a number of considerations overscoring and relieving the surface of his thought; and Dr. Carr, although he is delicate, suggestive, deft, and discreet, seems in a measure (however slight it may be), to explain the ideas of M. Bergson's philosophy in the sense of imperceptibly flattening them out. Not that the picture he presents of M. Bergson's philosophy is in the least degree flat, however.

What imparts the quality of relief to this picture is the enthusiasm with which Dr. Carr's mind is informed by M. Bergson's philosophy. The imperfections that lurk in M. Bergson's views, if we must acquiesce in the judgment of the majority of those who have expressed their opinion concerning these views, are to Dr. Carr as though they were not; further, Dr. Carr holds that the discovery of the "world beyond the atom" and the

triumphs of psycho-analysis lend confirmation to the system of philosophy that has won his adherence. Dr. Carr interprets M. Bergson's philosophy well, partly because he finds it corroborated everywhere—even in the most distant departments of science, and partly because he is unable to entertain in his mind unfavorable criticisms of his favorite doctrine. If it were true that he held to the letter of some parts of this doctrine more faithfully than even M. Bergson himself, this would, on the whole, be of advantage to a reader looking for an introduction to M. Bergson's thought. Dr. Carr's enthusiasm, then, is notable in the manner in which he has worked himself into M. Bergson's thought; it is notable, as well, in the manner in which he has worked his interpretation of this thought into the medium of the English language. Dr. Carr's writing is not only agreeable and fluent and lucid, but it fits idiomatically and snugly the singularity of many of M. Bergson's ideas. For instance, the homogeneous time that M. Bergson sets over against heterogeneous duration is designated "clock-time" by Dr. Carr; and Dr. Carr has many other phrases similarly neat. Dr. Carr's exposition, in a word, borrows a great deal of relief from this: that he has made the composition of this book a labor of love.

GEORGE PECKHAM.

COLUMBIA UNIVERSITY.

A History of Philosophy. CLEMENT C. J. WEBB. New York: Henry Holt and Company. Pp. 256.

This book may serve its purpose in a way not contemplated by its author or publisher. The reader of it, having found so little information about a mighty subject, may look elsewhere and thus pursue the study of the history of philosophy. A primer for the unprepared, telling about the whole history of philosophy, is what nobody can write. The subject can not be so popularized without losing all its substance. What the reader of any introduction should learn is that philosophy has never been child's play, and that it can not be conveyed in easy expositions. This is not to argue that small books should not be written on great subjects. It takes, however, a gift akin to genius to write them, and it is hard to see how a history of philosophy can be at the same time informing, small, and really elementary. The impression is too much like that produced by those extremely simplified arrangements of great music provided in albums *für die Jugend*. After all youth gets much out of them, and it is hard to say how much an eager and curious young person may not get out of Mr. Webb's book. He may, as we hope he will, read another book on the same subject, and thereby justify his introduction to it.

WENDELL T. BUSH.

COLUMBIA UNIVERSITY.

JOURNALS AND NEW BOOKS

THE JOURNAL OF ABNORMAL PSYCHOLOGY. April-May, 1916. *The Subconscious Settings of Ideas in Relation to the Pathology of the Psychoneuroses* (pp. 1-18): MORTON PRINCE. - Antecedent personal experiences form the setting which gives an idea what we call its *experimental egocentric* meaning. The setting is necessarily represented, according to the principle of conservation, by subconscious dispositions. Dispositions are acquired and innate; the acquired ones become organized with the innate dispositions into a complex which functions as a whole. Any conserved disposition motivated by almost any emotional impulse may become a subconscious process. The writer emphasizes the importance of a knowledge of the subconscious for psychiatry. *Obsessions of Normal Minds*: (pp. 19-22) CHARLES SCOTT BERRY. - A study of the character and extent of obsessions in normal individuals was made. The two hundred subjects were in educational psychology classes, almost all seniors in the University of Michigan. They were asked the following two questions and given two days to answer them: (1) Do you have or have you any fixed ideas? (2) Do you have any ideas which involuntarily come to you when fatigued? About 25 per cent. said they had had fixed ideas. Several of their accounts are quoted. In studying these obsessions the writer is struck by two things: "First, that without external assistance the obsession in so many cases seems to run its course and disappears, or at least loses its emotional force; second, that in a large percentage of these cases the beginning of the obsession goes back to childhood." "A careful study of the mechanisms of the obsessions of normal minds by means of psychological methods of investigation which proved so successful in the study of pathological obsessions would doubtless be of value not only in adding to our knowledge of the obsessions of normal minds, but also in showing their relation to pathological obsessions." *Psychopathology of Every-day Life* (pp. 23-47): MEYER SOLOMON. - A critical review of Dr. Freud's theories. "The mind that accepts Freud's conclusions as true and the mind that can not accept these views are different kinds. They stand at opposite ends and can never meet on common ground in the matters under discussion. *The Apparent Inversion of Time in Dreams* (pp. 48-58): LYDIARD H. HORTON. - Statistically, dreams of the sensory, or *presentative* type exhibit a stronger general tendency to *oniric inversion* type than do those of the psychic or *representative* type. The apparent inversion of time in dreams is explained by the apperceptive delay. *Abstracts. Reviews*: Boris Sidis, *The Foundation of Normal and Abnormal Psychology*: HARRY LINENTHAL. - Walter B. Cannon, *Bodily Changes in Pain, Hunger, Fear, and Rage*: GEORGE V. N. DEARBORN. - J. G. Frazer, *Psyche's Task*: MEYER SOLOMON. - Leo Kaplan, *Gründzüge der Psychanalyse*: ERNEST JONES. - Paul E. Bowers, *Clinical Studies in the Relationship of Insanity to Crime*: JOHN T. MACCURDY. *Books Received.*

- Brown, Warner. *Individual and Sex Differences in Suggestibility*. University of California Publications in Psychology, Vol. 2, No. 6. Berkeley: University of California Press. 1916. Pp. 291-430.
- Campagnac, E. T. *Converging Paths*. Cambridge: Cambridge University Press. 1916. Pp. viii + 113. 75 cents.
- Drake, Durant. *Problems of Religion: An Introductory Survey*. Boston: Houghton Mifflin Company. 1916. Pp. xiii + 425. \$2.00.
- Geyer, Denton L. *The Pragmatic Theory of Truth as Developed by Peirce, James, and Dewey*. 1914. Pp. 55.
- Jenni, Leonhard. *Jesus: Sein Leben und Wirken*. Lugano and Mailand: Verlagshaus Coenobium. 1916. Pp. 21.

NOTES AND NEWS

JOSIAH ROYCE, Alford professor of natural religion, moral philosophy, and civil polity at Harvard University, died at his home in Cambridge, Massachusetts, on September 14. Dr. Royce was born November 20, 1855, in Glass Valley, California, and graduated from the University of California in 1875. After a few years of study abroad, he was appointed to a fellowship at Johns Hopkins University, from which he received his degree of Ph.D. in 1878. He had conferred upon him the honorary degree of LL.D., from the University of Aberdeen in 1900, from Johns Hopkins in 1902, from Yale University in 1911, from St. Andrew's University in 1911; the degree of Litt.D. from Harvard University in 1911, and that of D.Sc. from Oxford University in 1913. From 1878 to 1882 Dr. Royce was instructor in English literature and logic at the University of California. He joined the faculty of Harvard University in the latter year as an instructor in philosophy, rising through the various grades until he became Alford professor, in March, 1914. Dr. Royce was a fellow of numerous learned societies, and was the author of a number of volumes on philosophical subjects, among them: "Religious Aspects of Philosophy," "The World and the Individual," "The Spirit of Modern Philosophy," "The Conception of Immortality," "Herbert Spencer: An Estimate and a Review," "The Philosophy of Loyalty," "William James and Other Essays on the Philosophy of Life," "The Problem of Christianity," and his last book, "War and Insurance," published during 1914.

THE Boston City Council has passed an ordinance that will give the city police court a medical department and psychologic laboratory. All offenders will pass through this department, the verdict of which as to their mental condition will be taken into consideration before sentence is pronounced. Dr. Victor V. Anderson is appointed as head.

THE OPEN COURT PUBLISHING COMPANY announce a new book on the war, "Justice in War Time," by Bertrand Russell, lecturer and fellow of Trinity College, Cambridge.

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

THE TRUTH-PROBLEM. II.

WE may now consider that sort of truth which is a function of mind, and which, therefore, brings us into the province of psychology. This is the sort of truth, I believe, which is the correlative of error. We have already anticipated the leading idea of the account which is to follow. In dealing with the hypothesis, we have found it necessary to introduce a mind, which assigns a value to a variable, and thus brings together a general function and a particular case of it. Such an enactment of mind is to be distinguished, as we have seen, from the simpler and more fundamental relation exhibited in existential truth. In the latter case a law holds directly of a thing or event, or is valid of it. But in the former case it is held of it, or applied to it, or otherwise united with it by the intervention of an external agency. Let us, therefore, examine this characteristic act of mind.

Although it has often been supposed to be peculiar to the cognitive situation and to be exemplified only in such acts as judging and believing, as a matter of fact it occurs more frequently in other forms of the mental life. Let us suppose $\phi(x)$ to represent a general function or law, and a to represent any existent thing or event. Then when ϕ holds of a , ϕ is true in the existential sense, as true of a . But whether or not it holds of a , ϕ may be said of a , or imagined of a , or asked concerning a , or thought of a , or believed of a , or judged of a , or enjoined upon a , or hoped of a , or expected of a , or dreaded of a , or made of a , or willed of a . It has sometimes been thought that the nature of the act of judgment somehow becomes transparent when it is reduced to the act of will or desire. This is a reduction to the more familiar, but not, unfortunately, to the more clear. Indeed the reverse procedure, exemplified by Meinong, in which desire is likened to judgment, is much more illuminating. But it is worth while to generalize the phenomenon and thus avail ourselves of any light that may have been thrown on any of its instances.

Since such acts of mind as were enumerated above are usually associated with external or internal speech, it will be well to begin with the act of speech itself. Suppose that I say to you, "This is a

rainy day." There is such a thing as raininess, and it may hold of to-day. But in the present case it is 'said of' to-day. Now it is characteristic of the nature of the act of saying that there is always a something said. And to distinguish this particular case of saying from others it is necessary to allude to *what* in particular is in this case said. To say is to say *something*. The something in question is not a part of the physical change in the organs of speech or in the surrounding media. Such changes constitute a saying only when qualified by a residual something for which we may borrow Meinong's term "objective." The objective is non-factual, in the sense discussed above; it is a part of the fact of saying. For acts of this sort which involve an objective, let us employ the term "intention"; and let us now inquire into the peculiar characteristics of saying which distinguish it from other sorts of intention. Confining ourselves to the case of vocal and auditory speech, we find that it consists of the formation of certain sounds which have, through association and convention, acquired the power to call attention to something, or prepare attention for something. This power is possessed not only by sound complexes *en bloc*, but according to certain structural rules.

Sounds functioning independently will also function in determinate ways according to their combination and arrangement. Thus "to-day" acting as it does, and "it rains" acting as it does, "it rains to-day" can function in only one way; it calls attention to a specific propositional complex. This principle of *the determinate functioning, structural solidarity, or integrative action of the complex symbol*, is so fundamental and far-reaching as to deserve further attention.¹

If we are to believe the anthropologists, "the evolution of language . . . may be regarded as a movement out of, and away from, the holophrastic in the direction of the analytic."² It is characteristic of the holophrastic or primitive type of language that it fails to discriminate identities. It contains expressions for total situations, such as 'looking-at-each-other-hoping-that-either-will-offer-to-do-something-which-both-parties-desire-but-are-unwilling-to-do.' This is a familiar situation in every stage of civilization; but while we express it by a combination of words all of which have other applications, the Fuegians express it by the unique word "mamihlapinatapai." The use of so long a word is not to be taken as an explicit recognition of the complexity of the event; but rather as evidence

¹ Although the analysis which follows applies especially to the case of words, it applies in principle to "ideas" of any sort, whether images or kinesthetic sensations, so long as they are the signs by which thought operates. The general problem of meaning, and the special problem of total or integrative meaning, are best dealt with first in the case of the function of words.

² R. R. Marett, "Anthropology," p. 141. Cf. Ch. V., *passim*.

of the need of using complex noises if one is to have enough noises to go round. The simple noises are few; the concrete situations with which even the Fuegians are familiar are very numerous. Similarly there will be a single word for 'cutting-a-bear's-leg-at-the-joint-with-a-flint.' A second situation in which cutting appears would be referred to by another vocal complex without any linguistic recognition of the common factor of cutting. Thus it is said of the old Huron-Iroquois language that while you can express twenty different situations of which cutting is a constituent, there is no word for 'cut.' The general function 'cut,' or ' (x) cuts (y) ,' is not, if we are to judge from language, discriminated at all. As language develops it provides more and more adequately for the abstract logical properties and for the universals, relations, or general functions which the natural world exemplifies. This means that languages become more complete without necessarily increasing the number of independent expressions. They economize sounds through using the same sound for the same universal in all the various contexts in which it appears. Thus it becomes more nearly possible for the finite number of sounds which the vocal organs can produce to cope with the infinite variety of individual situations.

But I wish especially to point out that in this development language becomes more free and creative. Suppose, for example, that the sequence of sounds "something-cuts-something" becomes the means of calling attention to the function of cutting with both its active and its passive terms. The first "something" is the signal for the active term and the second "something" is the signal for the passive term, *by virtue of the place of these sounds in the sequence*. In other words the arrangement of the sounds is by itself a linguistic instrument, independently of the sounds that appear in the arrangement. That being the case, it will be possible to put together sounds, each of which has its own efficacy, in such a way that they possess a determinate combined efficacy. They will affect the attention in a perfectly definite way, although the total vocal complex is new and has never been associated with any special experience. Thus, if I utter the word "scissors" in place of the first "something," and "the manuscript of Poe's 'Raven'" in place of the second "something," a cultivated English-speaking mind to which I address the total phrase will, as we say, "understand" it. The phrase as a whole will so affect that mind as to prepare it for a specific propositional complex, which it may never have experienced, or which may never even occur. To describe the state of mind that the hearing of this phrase induces, I should say that it is such that the occurrence of the event of scissors cutting the manuscript of Poe's "Raven" would find the appropriate apperceiving mass or sensory adjustment

in readiness. In this way it is possible that the mind should be put in readiness for things it has never met, and so be enabled to discriminate them should they come. Or the mind may, as we say, "frame" hypotheses, which it may try, or merely enjoy.

Let us return to our original example. I am supposed to say "it is raining to-day." If you understand me then your mechanisms of attention are set or are alert in a certain way that the physiologist might describe in his characteristic terms. But in so far as the physiological complex is an instance of attention, one must speak of it as set *for* something. In this case the presently falling rain would find you already looking toward the sky, with your hand on your umbrella, and with a characteristic group of associations in play. No other event would find you ready. Your state of mind possesses a character that can be stated only in terms of an objective,—a hypothetical or non-factual situation. Whether the situation occurs or not, the determinate readiness is there just the same. It may be a mere "say so" on my part, or a mere "supposing so" on yours; which is, of course, a very different thing from nonsense on my part, or a mere confusion of mind on yours. It should be remarked, perhaps, that one may say something without being understood. In that case the speaker intends to be understood, that is, he intends to produce a certain effect upon the mind of an auditor. In other words, not only is the object of the understanding hypothetical, as above described; but also the state of understanding, the set of the attentive mechanism in the auditor. This last in turn is the objective by which one describes the act of speaking. The articulatory process is "calculated," as we say, to produce a certain effect. It may or it may not produce it; but the conformation and direction of the process by virtue of which it is an act of speech and not a mere production of noises can be defined only in terms of such an end result. Thus an intention may have intention as its objective.

Let us now consider the case of an injunction such as Joshua's commanding the sun to stand still. There is such a thing as 'standing still,' and it may simply hold of the sun. But in the present case it is applied to the sun by the act of Joshua. Now it is characteristic of this act that the sun's standing still somehow qualifies it. It would be impossible to describe Joshua's injunction without referring to this propositional complex. It is of the nature of a command that there should be something-commanded; and Joshua's particular command can not be distinguished, save in terms of *what* he commands. The 'what' of the command is a hypothetical case of the general function of immobility. It is framed by inserting the sound for sun in the place of the variable which this function provides. The rules of sentence structure being what they are, the whole com-

plex function solidly begets in the object that receives the injunction a set of which the sun's being immobile is the objective.

But we must now distinguish the peculiarity of an act of command. This peculiarity is not to be found in the objective of the understanding mind, for that is the same whether Joshua commands the sun to stand still, or merely mentions the possibility of its standing still. One may command or merely say the same thing. The act of command includes the act of speech, and the objective of the act of speech is a part of the description of the act of command. It is intended that what is said should be understood. But in the case of command, it is intended over and above this that the sun should obey. This implies on the part of the sun not merely a preparation of the attention, but a motor process which shall have the character of tending to arrive at that same state of immobility to which the attentive mechanism points. Obeying is a peculiar correlation of two intentions having the same objective. The obedient must understand and do the same thing. This complex effect upon the sun is intended by Joshua. A reference to it is necessary if one is to describe his performance. An act of command employs words in their peculiar power to control the attention of their auditor. But it must employ other instrumentalities as well, such as the imperative intonation and emphasis calculated to affect the will through arousing fear or through evoking the instinct of subjection. Or the formulation of the command may be accompanied by a threat, that is, by words calculated to arouse an expectation of penalty. Behind these overt aspects of the act of command is a disposition or set, a readiness to follow up the first measures by whatever other measures may be necessary. The command may be irresolute or relentless, according as this set is shallow or deep-seated, that is, according to the extent to which it commands the energies and time of the organism. In either case it has direction or reference to a hypothetical event in which it would come to rest. The whole complex, overt and dispositional, has a unity which can be characterized only by reference to this objective. And this characterization holds or is existentially true of the act of command even if the command is not executed or even heard; even if the object on which the command is enjoined is incapable either of hearing or of executing. Thus even if we should believe the sun's obedience to be fabulous, it would not be necessary to suppose Joshua's command to be fabulous also.

Now let us waive for the moment the sun's inability to hear and understand. Supposing the sun to be equipped with a nervous system of standard human capacity, and to have a good ear for spoken Hebrew, it is possible that the sun should have its attention directed to its immobility, without having its will so affected that its actions

take the same direction. The sun would then be said to disobey Joshua's command. This might be due, for example, to a counter-set on the sun's part directed toward the vexing of Joshua. But the sun can be said to disobey the injunction of immobility only because it has been proposed as an instance of immobility in an objective which describes Joshua's act of command. If it hadn't been coupled with immobility through the supervening intent of this act, it would not have been in any sense under the jurisdiction of the principle of immobility, and could not be said either to have obeyed it or to have disobeyed it. The disobedient sun is a sun which moves, or is an instance of mobility, when immobility is enjoined upon it; where it is the same sun which appears both in the fact and in the objective, and where the two general functions, mobility and immobility, are contradictories. If it were not commanded to stand still, its motion would still contradict the principle of immobility, but quite innocently. It could not, then, as in the case of its being so commanded, be said to contradict *its* immobility, for '*its* immobility' would then have no meaning. Its mobility would be a fact, as would the contradictoriness of mobility and immobility, but the application of immobility to it, a propositional complex appearing only as a description of the act of command, would be missing. And without this specific propositional complex immobility would not be in any sense its law.

The bearing of this analysis upon the conception of miracles is evident. That conception rests upon a confusion of injunction and natural law. An event can not break a law that is true of it in the existential or material sense. If the sun were to stand still at the command of Joshua it would not break the laws of astronomy. It might observe other laws in addition to those of astronomy and consistent with them; or its behavior might prove that what had been taken to be the laws of nature required correction; or the novelty of the performance might astonish the spectators and so defeat their expectations. In any case breach of law implying that the broken law is somehow, nevertheless, mandatory upon an agent or event, has no meaning apart from the creation by some external agency³ of an objective connecting the two.

I do not wish here to multiply instances of intentions and their defining objectives, but only to insist upon their extremely common occurrence. Without these conceptions I see no way of characterizing the function of words or any of the commoner acts of mind. These conceptions are even involved in constructive performances of

³ The same analysis would apply to the conception of "ought" in the ethical sense. In so far as a moral imperative can be either obeyed or disobeyed it must be embodied in some purpose which unites the agent and a certain rule.

life which do not imply consciousness in the ordinary sense. It means nothing, for example, to speak of a carpenter as making a table, unless we are permitted to say that his bodily movements in relation to a given material tend to a certain result which may or may not occur. Whether or not the table materializes, the carpenter is in fact making one when his neuro-muscular set is such as *would* under favorable conditions terminate in an existent of a certain description. The table does not necessarily exist, but it must be *true* of the carpenter's actions, if those are to be regarded as definitely constructive in character. It is the objective which distinguishes the making, which may otherwise consist of a great variety of organic states and changes. When we now turn to the specific cognitive situation, with its characteristic duality of correctness and error, we shall find a further illustration of these conceptions; and we shall at the same time find, I believe, that they suggest a solution of certain outstanding problems.

It is my contention that correctness, or truth in the sense in which it is a correlate of error, is truth of this fourth type in which it is necessary to introduce over and above the principle of contradiction, the difference between 'is' and 'is not,' over and above the difference between fact and its non-factual constituents, over and above the difference between a law and what it is true of, the specific additional factor of an intending mind. I may put the matter generally by saying that in truth of this sort a law is applied or referred to a thing by an act of mind, and that it is to this use or misuse of the law that the truth or error attaches. Let us see how well this view will serve to mitigate the difficulties which attach to the possibility of error.

These difficulties are all of one sort. *It seems impossible to define a situation that shall be cognitive without providing that the cognition shall be true.* The central problem of truth in this genuinely epistemological sense is the definition of the *fallible mind*. How shall we qualify the cognitive situation sufficiently to make error significant without qualifying it so much as to make error impossible?⁴

There are three respects in which the situation in which error

⁴ The idealist or the relativist would perhaps say that this is impossible, that cognition is always true in some degree. But such a view does not remove the difficulty. For if cognition is only partially true, then it must be deficient in some respect, while adequate in others. And unless it somehow claimed to be adequate in that respect in which it is deficient, it could not be charged with error. Cognition that is true as far as it goes without going far, is a very different matter from cognition that goes beyond the limits within which it is true. In this factor which would be corrected and not merely supplemented in a true knowledge we meet with that flat error, that downright wrongness, which gives rise to the traditional difficulties.

occurs resembles that in which truth occurs. All these are indispensable to a specific, verifiable, cognitive claim without which there is neither merit of truth nor liability to error.

1. In the first place there is the committal-attitude of mind, such as belief. One does not submit one's self to a test of truth or error until one commits one's self. It is quite possible to characterize a tentative proposal as true or erroneous in a tentative sense. But one can always escape the charge of error if one can say that one hadn't really in any degree adopted the proposal. And both the merit of truth and the harm of error increase proportionally to the depth of the conviction or sense of certainty. I can feel very sure and yet be in error; in which case the surer I feel the more mischievous the error. So that this quality of mind affords no differentia of truth.

Let us consider this common subjective factor of committal in the light of the conception introduced above. Belief, for example, although it usually involves speech, evidently involves more than speech. It is more than a determinate set of the attentive mechanism. This residual factor, or differentia of belief is to be found, I believe, in a determinate motor set. It is a preparedness, not merely to apprehend a certain contingent event, but to deal with it. The reaction which is appropriate to that event in view of the interests which are at stake, is organized and held in readiness. To be committed, to have burned one's bridges and gone in for a belief irretrievably, means that one's readiness for event *a* so far commands one's resources and determines the correlation of neuro-muscular mechanisms, that event *b*, or the case of *a*'s not occurring, would catch one unprepared. One has put all of one's eggs in one basket. In this way confident belief differs from a state of general resourcefulness or a preparation for alternative contingencies. Belief is a physiological configuration of which it is true that it constitutes a determinate preparedness to cope with such and such an event. Beliefs may vary limitlessly in the extent to which they exclusively possess an individual organism, and in the extent to which they are already carried into effect in overt action. But this anticipatory adjustment to a contingent event is in all cases their distinguishing mark.

Let us consider the case in which the element of committal is at a minimum, the attitude which characterizes the inquiring, experimental mind which is trying its proposals without entrusting its interests to them. This is the case when a proposal is adopted for purely theoretical purposes. Such an attitude consists of an undertaking to look in a certain quarter, and to behave in certain prescribed ways according to what one does or does not find there. The

procedure is similar to the popular expedient of playing a game under rules, and is exemplified by the tossing of a coin to decide precedence. Having agreed to decide precedence by the toss of a coin means that *A* and *B* commence a train of actions, spinning the coin, letting it fall, looking at its upper face, etc., with a certain readiness on each part to take first place or second place according as the upper face does or does not agree with one's call. From the moment when the agreement is in force we must suppose that there is in each organism a "determining tendency" set, or intention⁵ which regulates its behavior and determines it at the terminal stage if this is reached. Similarly, when the scientist experiments he enters upon a series of acts, of which the last would be either a renewed and deepened acceptance of the tentative proposal or the abandonment of it. In discussion there is a tacit agreement that *A* shall adopt *B*'s proposal, or *B*, *A*'s, according to what is found in a certain quarter to which the attention of both is directed. The psychology and physiology of these processes are still obscure, but in view of the investigations of Freud, Sherrington, and the Wurzburg School, there can be no doubt, I think, that the rough account that I have offered is in agreement with the general trend of opinion in these sciences.

Truth and error involve first, then, an act of intention, such as belief or tentative committal, which is indistinguishable in the two cases and can not, therefore, afford the differentia of either.

2. In the second place, truth and error both involve an objective, and are also indistinguishable in this respect. Moreover, the presence of this objective factor in error would seem to belie its supposed erroneousness. Let us confine ourselves to the case of belief. In order even to believe erroneously I must believe something. There must be the something for me to believe. That which I believe is what I believe it to be. Then how am I in error? What I believe possesses the solidarity of a propositional complex. I believe that (Abel slew Cain). It is not correct to say, as Mr. Russell once suggested, that what I believe is 'Abel,' and 'slew,' and 'Cain.' Apparently, then, Abel must have *slain* Cain in order for me to believe it. But in that case how can my belief be other than true? It would be possible to say that 'Abel slew Cain' subsists as a propositional complex that happens to be false in the first sense of simple negativity. But in that case we would have either 'Abel did not slay Cain' or 'Abel slew Cain is false' as a subsistent entity; and believing either of these would be different from falsely believ-

⁵ Save in that it is not necessarily a datum for introspection, this would appear to be equivalent to the "problem" or *Aufgabe* of the so-called "Wurzburg School." Cf. Titchener's summary in his "Experimental Psychology of the Thought Process."

ing 'Abel slew Cain.' Or one might say* that while there is a positive subsistent 'Abel slew Cain,' there is no *object* 'Abel slaying Cain'; and that to believe the objective in that case is to commit error. But even so it must be possible to believe a propositional complex truly, if there is one. And it would be necessary to distinguish the case in which I believe the objective 'Abel slew Cain' simply from the case in which I believe it *of* Abel. Furthermore it is extremely difficult to understand the difference between the objective 'Abel slew Cain,' and the object 'Abel slaying Cain' in the case of truth, where it is necessary to suppose them both.

Now I believe that we can avoid this difficulty if we say that the complex of symbols, "Abel slew Cain" is so constructed as to be significant as a whole. There is such a thing as 'somebody slaying somebody.' There is such a thing as Cain, and such a thing as Abel. One directs attention to the former by the expression " (x) slays (y) ," and to the last by the words "Cain" and "Abel." Substituting these words for " x " and " y ," results in a complex symbol such that a determinate fact *would* be its object if it had an object. This hypothetical reference is a part of the symbolic fact, a true description of the symbol in the third or existential sense. There is a symbol such as to prepare the attention for the propositional complex, 'Abel slew Cain.' That complex itself has no ontological status. It neither exists as Cain and Abel do, nor subsists as the general function ' (x) slew (y) ' does. It is like a law of nature in that it has no standing except that of being true *of* some thing, which in this case is the symbol. In so far as I *believe* that Abel slew Cain, this objective is true not only of a complex symbol, or attentive set; it is true also of a motor set or plan of action.

An act of cognition, whether true or erroneous, must then have this objective reference. It must have a deliverance, a purport. My belief is capable of being true or erroneous because it is a believing something. But this something, or objective, need so far be nothing more than an adverbial qualification of my act of believing. It is the way I believe. It neither involves nor predetermines anything external to the act of belief itself. We may then hope to find the differentia of true believing in something beyond, in some verifying or disproving fact that belongs to the environment of the act. This, however, brings us to a fresh difficulty, since the verifying fact must somehow be peculiarly relevant to the objective of the belief. How then are we to explain this connection which carries us beyond the act of belief itself? This constitutes our third difficulty.

3. Whether a belief be true or erroneous, there will be the same subjective conviction, there will be the same "something believed,"

* I understand this to be Meinong's view.

and as we must now recognize, there will be the same object of which it is believed. In order to be either true or false a belief must have a point of application. In every belief, whether true or erroneous, something is taken for granted, is referred to, or is that which the belief is *about*. This may be an object of acquaintance, not symbolized; it may be symbolized by pronouns "this," "that," "he," "it," etc., while also an object of acquaintance; or it may be named. In the last case the object must *be*; that is, the naming relation must have an object. If it should be discovered that there was nothing named, the belief would not have been proved false, but would have been proved no belief at all. It would, however, prove to have *been based upon* a belief which in turn would have its given object. Let us call this datum of which something is believed the intended object. Thus if I believe that 'it is raining to-day,' then I am believing 'raininess' of to-day. 'To-day' is a datum. Any question concerning the truth or erroneousness of my belief must be referred to 'to-day' as its locus of verification. In this sense all beliefs must both be verifiable and also include their locus of verification. No counterclaim calculated to disprove my belief could be made without including the same datum. Without such identity of reference I could claim immunity by saying "That is not what I was talking about." Sometimes, as in judgments beginning "there is," "if," etc., the belief appears to be free or unrestricted in reference; but in that case one is really believing of existence or being in general. It is sometimes held that existence in general is the subject of all judgments. But this will not account for the important difference between "there is a tallest living man" and "*he* is the tallest living man." In the latter case one is believing the predicate 'greatest stature,' of a particular datum with which the judge is immediately acquainted. Nothing is gained by dividing the belief into two beliefs, "there is a tallest living man" and "it is *he*"; for the second of these component beliefs will still have a unique application.

Now there is an apparent difficulty in supposing that the object of belief must exist in the case of error; for what more could be required of truth? If in order to believe at all that of which I believe must be there as a datum, existing independently of my act of belief, but incorporated into it—if belief is thus an actual contact with reality external to it, how can belief fail to reveal reality, and so to accomplish its purpose?

But this difficulty disappears when we recognize that although the object of belief must be, it need not be *as it is believed*. There is still a contingent factor which will serve to distinguish the case of truth from the case of error. That residual and external circumstance is the fact concerning the object of belief. In order to believe

'that it is raining to-day' there must be 'to-day,' and 'raining'; but it is not necessary that raining should be true of to-day, in the third or existential sense. When that is the case the belief is true; when not, or when what is true of to-day is related to 'raining' as its contradictory, then the belief is erroneous.

Let us summarize the analysis of our fourth species of truth. In every case of correctness or error there is what may be called the "attitude of committal," a characteristic disposition or process on the part of the psycho-physical organism. Committal or belief, like other cases of intention, will have an "objective" without which it can not be defined, which is a part of the fact of believing or committing one's self. This objective contains a general law or propositional function, and a datum, each of which is in itself independent of the act of belief. But they are integrated through the combination of their symbols according to rule, so as to give rise to a solid propositional complex. The objective thus integrated is related to the belief as an adverbial entity is related to a verbal entity. One believes 'thusly,' where "thus" signifies the objective. The datum itself, as part of the environment, is the object of the belief. Taken as a component of the act of belief, it is what is usually called the "subject" of the judgment. The propositional function will be what is usually called the "predicate" of the judgment. There will be, furthermore, a *factual test* which is external to the act of belief. This will be the fact about the object, in which by the law of excluded middle, either the predicate or its contradictory will hold of that object. The datum or object is the area of intersection of the objective and the factual test, the pivot on which the cognition turns, the necessary tangential point at which the mind is in contact with its environment. The factual test will be that independent, transcendent factor on whose decree the act of cognition must wait. This factual test gives one or the other of two decrees, according as its law or propositional function is the same as that of the objective, or is contradictory to it.

Thus the pragmatic theory is correct in emphasizing the formative, creative action of mind, and in likening the cognitive situation to the desiderative or volitional situation. The coherence theory is correct in emphasizing the decisive part played by the logical principles of contradiction and universality. The correspondence theory is correct in emphasizing the factor of agreement or disagreement, with its flat disjunction between truth and error dependent on the decree of fact. Finally, all those theories are correct which maintain that, a belief being what it is, and its environment being what it is, the truth or error of the belief is determined in advance of the moment of evidence. A mind which entertains a specific expectation

under specific circumstances is, unless the one or the other is changed, then and there either "doomed to disappointment" or "prepared for what is going to happen." Similarly, believing what one does of what one believes it of, and the facts being such as they are, one is predestined to cognitive failure or success.

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TOPIC FOR DISCUSSION AT THE 1916 MEETING OF THE AMERICAN PHILOSOPHICAL ASSOCIATION

THE executive committee of the American Philosophical Association makes the following announcement concerning the programme for the special discussion at the next annual meeting of the association, to be held in New York, probably on December 27, 28, and 29, 1916.

I

Among the new developments in American philosophy and psychology of the last dozen years, none has been more widespread or more noteworthy than the reaction against the traditional sharp division of the data of experience into the two classes of "mental" (or "psychical") and "physical." Philosophers of more than one school, psychologists desirous of defining accurately the distinctive subject-matter and methods of their science, and psychiatrists seeking to formulate the theoretical presuppositions most serviceable to their practical aims, have joined in attempts to transcend, to mitigate, or to abolish the "Cartesian dualism" and to substitute therefor the conception of a homogeneous "world of pure experience," or of a "psychophysical continuum," or of the fundamentally "neutral" nature of the entities with which experience is concerned or out of which it is constituted. Other writers, not sympathetic with these attempts, have nevertheless expressed the view that the antithesis of mental and physical has in the past been ill defined and confusedly applied. Still others have continued to maintain that the antithesis is a necessary, fundamental, and radical one, and that the endeavors to eliminate it or to minimize its importance have been both the result and the cause of logical confusion, and of a failure to bear in mind pertinent facts and distinctions.

It has therefore seemed to the committee a suitable time for the association to make provision for an examination of the results of this tendency, since 1904, and for an attempt to bring about a further clarification of the matter at issue, by means of a general but methodical and connected discussion.

The committee therefore proposes, as the topic for the principal discussion at the 1916 meeting of the association, the two following

GENERAL QUESTIONS

A. Is the division of the entities¹ present or involved in experience into two reciprocally exclusive classes of "mental" (or "psychical") and "physical" to be retained?

B. If so, how is the distinction to be formulated? In particular, what is the essential differentia of the class "mental" or "psychical"? Are the entities denoted by it attributes, "aspects" or relations of things² which at the same time may possess the predicate "physical"; or are they a class of existing things which can never possess the attribute "physical"? What, specifically, are the entities denoted by the term "mental"? And how, if at all, is their existence³ to be established?

II

In order that the discussion may be based upon a review of recent reflection, on the second of the above questions, participants are asked to bear in mind the following current views concerning either the definition or the denotation of "mental," together with the arguments advanced by recent writers in defense of these views:

1. "Mental" entities are those which have no spatial position or magnitude (cf. Bibliography, No. 31).

2. "Mental" are any entities which, though they may have spatial attributes, do not have position or magnitude in the "real" or objective space accessible to the generality of percipients; do not constitute a part of the sum of energy or of energy-possessing objects recognized by the science of physics; exist as functions of the existence of sentient organisms; and constitute separately centered or individuated systems. Among such entities are percepts and ideas (Bibliography, No. 17, pp. 75-77).

3. "Mental" are all entities which depend for their existence

¹ The word "entities," as here used, is to be understood as applicable to any elements or factors given in experience or conditioning it; as applicable to processes, qualities, and relations, as well as to "things" or "objects"; and as implying no more concerning the ontological status of the elements or factors to which it may be applied than that they either (a) are actually presented in some experience, or (b) can be shown to be necessary conditions or implicates of some experience.

² The word "things" is here used to signify any entities which are not mere qualities, nor relations nor actions of some other entity.

³ "Existence" is here used in a sense parallel to that of "entity" above. The "existence" of a thing, in other words, could be established, for the purposes of the present discussion, either by pointing to its presence as a datum in some actual experience, or by showing it to be a necessary condition or implicate of some such experience.

upon their existence *for* some conscious Self, together with such Selves; and all entities are either Selves or existences for Selves.

4. "Mental" are those contents in any experience which, in contrast with standard or "real" objects, are looked upon, in some external or subsequent corrective experience, as caused or affected by an individual or special "point of view"; *i. e.*, as subjective in the ordinary sense. Beyond these, there exist no entities to which the designation "mental" can be significantly applied (Bibliography, No. 29).

5. "Mental" entities are a class of entities essentially and existentially distinct from "physical" entities, and also are never "objects" or "contents" lying in the general field of experience. They consist of one or more of the following kinds of entities:

- (A) Inner activities or (non-physical) processes, involved in experience, but not at the same time data of experience (Bibliography, No. 1).
- (B) Such acts together with certain qualities exclusively characteristic of them (Bibliography, No. 24).
- (C) Conations and affective states or "attitudes" (Bibliography, No. 2).
- (D) Selves, as not-presented centers, or possessors, of experience (Bibliography, Nos. 5, 9).

6. "Mental" entities are not different in their essential nature from non-mental (or physical) and do not constitute a numerically or existentially distinct class of entities, but are the *same* entities "taken" in a special context or relation into which they enter, *viz.*, the context of a "personal biography" (Bibliography, No. 15, especially pp. 217-233).

7. "Mental" entities differ from physical, not qualitatively, but statistically, *i. e.*, in the frequency of their occurrence in experience or in their degree of definiteness and stability. Contents of experience are mental or physical in so far as they are indefinite and rare, physical in so far as they are definite and common (Bibliography, No. 13).

8. "Mental" are any groups of entities, or situations, in the experiencing series which are characterized by a hesitation in direction; and beyond these there exists no class of entities which can be significantly called "mental" or "conscious" (Bibliography, No. 6).

9. "Mental" and "physical" are two radically distinct, but (at least in the organic world) inseparably conjoined "aspects" of, or "ways of regarding," phenomena of experience, the one being the "inner" or subjective, the other being the "outer" or objective, aspect. The relation between these two aspects is analogous to the relation between the surface and the mass of a body (Bibliography, No. 38).

10. "Mental" or "psychical" entities are a special form or manifestation of "energy," *viz.*, free energies dissociated from matter, which have proceeded from distant objects to a brain, where they constitute by their "implications" a consciousness of those objects (Bibliography, Nos. 25-27).

11. "Mental" are those aggregates of "neutral" entities which constitute the portion of the environment, outside the nervous system, to which a nervous system is responding by some specific response. The "neutral" entities, of which both physical and mental entities are species, or specific aggregates, are generically *logical* entities, *i. e.*, concepts and propositions (but in a realistic or non-psychological sense of those terms) (Bibliography, No. 4, especially pp. 181-4, 62-4).⁴

III

The committee has thought it best to state the principal topic for discussion in the comparatively general terms of the questions proposed in the first section of this report; and to ask members of the association to consider, in connection with those questions, a rather wide range of recent attempts to formulate the nature of the distinction of "mental" and "physical." Thus, no restriction is placed upon the freedom of participants in the discussion to attack the general problem by any methods which seem to them suitable—provided only that they establish some definite connection between their contribution and the recent reflection of others upon the subject.

The committee, nevertheless, recognizes that the general questions, as above presented, are not ideally adapted to bring about a sharp focusing of issues; and it notes that the several views which have been indicated in Section II. are not all concerned with exactly the same problem. The committee, therefore, offers certain further suggestions, consideration of which by members, it believes, will be conducive to a more effective and connected discussion and to a more direct joining of issue between the representatives of different views.

1. It is evident that the general questions proposed are in part terminological and that in recent discussions of the psychophysical antithesis, questions of terminology and questions of fact have in some degree become intertangled. It is a subsidiary purpose of

⁴ The foregoing is not intended to be an exhaustive enumeration of current views concerning the psychophysical distinction; the list might easily have been extended. Since the topic of the present discussion is in part identical with the second question proposed for the discussion of 1911, members are referred to the programme of the latter for examples of other opinions relevant to the matter at issue, and for further bibliographical references, see this JOURNAL, Vol. VIII., pp. 704-706. The above brief statements of the views mentioned are doubtless in some cases inadequate; but the reference given for each indicates a full and typical presentation of it.

the discussion, as conceived by the committee, to do something to decrease the prevalent diversity and confusion in the use of the terms "mental" and "physical." The answers to Question "B" above mentioned alone show that extremely various and incongruous senses have come to be attached to the former term; and a more extensive review of current usage would show a still wider range of meaning. This increasing diversification of the senses of the one word is partly due—it will be further noted—to the fact that different writers, in dealing with Question "B," are engaged in essentially different logical procedures. Some, taking the denotation of the word as given, attempt to define or to describe the true nature of the entities denoted by it. Others, taking the connotation or definition as given (though not always the same definition), are concerned to determine what entities—or whether any entities—corresponding to this definition actually exist. Still others, departing more or less widely from previously current connotations and denotation, seek to give the word a new signification and a corresponding altered application. The committee calls attention not only to the obvious importance of keeping the question of terminology sharply distinct from the philosophical issues involved, but also to the desirability of clear statements from participants who deal with the terminological question, as to which of these three procedures they propose to follow.

The committee would further note that the diversification of the meaning of "mental" seems to be due in part to a tendency to apply the adjective only to entities which are believed, by the writers so using the word, actually to exist. Thus the meaning of a technical term is made dependent upon the philosophical views of those who employ it; and the word tends to have as many senses as there are diversities of doctrine concerning certain metaphysical and psychological problems. The committee would raise the question whether this is desirable or unavoidable.

2. The matter of chief moment in the discussion, however, is, of course, not what entities (real or imaginary) can most suitably be called "mental" or "psychical," but whether certain asserted entities, which (suitably or otherwise) *have* been so called, exist and are to be recognized by metaphysics and by psychology. The committee suggests that in the discussion of the general questions (taken in this sense), the essential philosophical issues, and also the relation between these and the question of terminology, might perhaps be most effectively illuminated, if participants would address their reasonings to the following supplementary questions, or to some portion of them:

1. Do non-physical⁵ entities exist, as data or implicates of experience?

⁵ By "non-physical" is here meant entities having all of the three follow-

2. If so, which of the following are to be recognized as actually existing and non-physical entities?⁶ (a) Selves or subjects (as distinct from "content" in general, and from any of the following). (b) Awareness, as a process or activity distinct from "content" in general, and from any of the following. (c) Conations. (d) "Affections" or feelings. (e) Activities or processes distinct from all of the preceding. (f) Sense-qualities in general. (g) Secondary qualities. (h) Veridical percepts and "ideas," considered as cognitive. (i) Non-veridical percepts and ideas. (j) "Meanings." (k) Universals or "logical" entities. (l) Entities not identical with any of the foregoing. (If so, of what character?)

3. If the existence of any of these types of non-physical entities is granted, do those which exist (or any among them) exist only in, or in connection with or dependence upon, those complexes known as the "experiences" of individual persons or organisms? Or may such non-physical entities exist apart from and independently of such complexes? If any exist exclusively in these contexts, which of the above mentioned types of entities are they? And if any may exist not in these contexts, which are they?

4. In the matter of terminology; can a generally acceptable definition of the terms "mental" and "psychical" be reached by (a) defining the term "physical"—in the manner implied by the above definition of "non-physical," or in some other manner—and then (b) letting "mental" and "psychical" signify *any entities or supposed entities which are both non-physical, and existent only as functions of the experience of one or more individual persons or organisms?*

It is manifest that, even when certain of the main issues implicit in the general topic are thus discriminated, many large philosophical questions are involved, and that the possible range of the discussion is extremely and perhaps excessively wide. It has, however, seemed to the committee best that the discussion should be carried on with definite reference to a fairly comprehensive, if not a complete, initial conspectus of the pertinent problems and theories. It lies, however, within the power of the leaders of the discussion to agree upon a narrower delimitation of its field. The committee would, in any case, suggest that the present discussion may serve as a useful preliminary to a discussion of the question of psychophysical interaction at some subsequent meeting; and that it is, therefore, inadvisable that

ing negative characteristics: (a) They do not possess mass; (b) they do not have position or extensive magnitude in "real" space; (c) their properties or modes of existence and action are not describable in terms of the laws of the science of energetics.

⁶ It is not assumed by the committee that these classes are necessarily exclusive.

the latter question be entered upon extensively in the course of this year's discussion.

IV

For the conduct of the discussion the committee has adopted the following plan.

(1) Six leaders will be selected by the committee. (Names will be announced subsequently.)

(2) These leaders will either publish brief papers in advance of the meeting, on the topic of the discussion, or will indicate already published articles or passages, by themselves or others, expressing the theses which they desire to maintain. These articles or passages will be designated in the official notice of the meeting, or in some other manner.

(3) The leaders will also present at the meeting papers not more than twenty minutes in length.

(4) The leaders will, before the meeting, exchange briefs indicating the considerations which it is their purpose to present.

(5) Full opportunity will be given members at the meeting for extemporaneous discussion of the papers of leaders, and of the subject in general; and it is also hoped that a number of members will either present written contributions (limited to twenty minutes) on the topic at the meeting, or will publish such contributions before the meeting. Those who intend presenting written papers at the meeting are asked to send brief summaries beforehand to the secretary, so that their papers may be placed upon the programme at the most suitable points.

(6) At least two sessions of the annual meeting will be allotted to the special discussion.

For the Executive Committee:

A. O. LOVEJOY,
Chairman.

E. G. SPAULDING,
Secretary.

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REVIEWS AND ABSTRACTS OF LITERATURE

Introduction to the Science of Ethics. THEODORE DE LAGUNA. New York: The Macmillan Company. 1915. Pp. 411. \$1.75.

Among recent text-books on ethics this is, perhaps, easily the most progressive and radical. This remark refers particularly to part three, which is in reality *the* book. On the whole the treatise seems to possess great value. Something should be said on each part.

Part one, entitled "The Field of Ethics," discusses, and that well, the usual topics covered by the title. In the chapter, however, devoted to the problem of responsibility and freedom, we have one more endeavor to state determinism in terms of indeterminism; a hopeless and futile undertaking. It leads to inevitable confusions in thinking. For example, in an endeavor to protect determinism from the charge of fatalism, presumably in its Oriental form, that man of straw so easily to be bowled over is set up. But this is not the determinism which is fatal to any real morality, and which determinists seldom seem clearly to understand. When it is argued that one's belief in part determines action, no indeterminist would deny it. But that is not the same thing as acceptance of the dogma of universal inexorable sequence of cause and effect, to which the consistent determinist is driven, or else he is, though he may not know it, an indeterminist. A sample of the confusion in thought appears, for instance, on page 58. "The determinist believes that his impulses are efficient causes by which the future course of events must in part be shaped. . . . He believes that his efforts count for something in determining his happiness or unhappiness. Why then should he cease to struggle?" But if he is a consistent determinist he believes much more. He believes that his beliefs and efforts are themselves determined as fixed events in the unchangeable series. Even his belief in his beliefs

is such a fixed event. To make "determinism a regulative principle" in an "intellectual policy" (p. 61) is to turn oneself into an indeterminist. In summing up (p. 65) we find: "At bottom determinism and indeterminism have stood for very much the same thing. . . . Both have pointed to the truth, that man's character is the essential cause of his acts, and that upon this causal relation his moral responsibility depends." To say this seems to the reviewer to be guilty of a piece of logical inconsequence, surely unconscious in so sincere and honest a thinker as is our author. For what is this "character, the essential cause," but the fixed effect of antecedent causes. To say a man behaves as he does, because his character is as it is, is like saying lead and iron behave as they do because of what they are. This is to bring character under the concept of physical nature. It has been somewhere beautifully said: "The planets swing round in their orbits *freely*." So do men in this view of their acts move as freely as the planets and freely in no other sense. But this muddles the concept of freedom hopelessly.

To the reviewer there seems nothing better to be done in this matter than what William James so frankly did. As between a logically consistent determinism and its only true opposite, the novel, the genuinely new, not to be found in any prior causes, he dared accept the latter. Call it, if you will, chance. He did not fear the word. Between a closed, and to a certain extent an open universe, in the face of the facts, there was to him no choice. The open universe was the only thing he could stand. If there is no open universe, there is nothing but clean barefaced determinism and there is not in it "all the freedom you want," as theoretical indeterministic determinists are wont to say. There isn't any, and "free behavior according to your character" has not a scintilla of freedom in it, in any real form.

In the following chapter, entitled, "A general survey of moral standards," there is an admirable exposition of the various kinds, or types, of standard actually used by men in their judgments of character and conduct. It is made evident how these different types of measurement have always their limitations, how they overlap, and in their cross classifications confuse the minds of men. Not one of them can be carried through consistently, yet each in its degree is justified, and there is no getting on without each, though it may be exceedingly difficult to use each properly in its place and in its degree. This is evidence of a very commendable breadth of mind.

The second part of the book, some eighty pages, is devoted to an exposition of the classical schools of ethical philosophy, from the sophists of Greece to the thinkers of the nineteenth century. This seems very well done. The desideratum has been for teachers of ethics to undergraduates just such a brief outline as is here given. The progress of the movement is to be made clear, the creators of ethical theory are to be made known, and yet multiplicity of details and names so far avoided as shall neither falsify the record nor confuse the beginner's mind. This the book seems to have done on the whole well.

Of course there will always be two difficulties in any such undertaking.

You can not please everybody. Some things should not be presented just so. On the other hand, it is hard for the man of learning to divine just what will be needed by the beginner. Indeed, it would seem that the only man who can read an outline with profit and understanding is the man who does not need it, while the man who most needs it can not get much out of the outline written for him. However, if any outline can be profitable for the undergraduate, this seems to me just the sort of one that is needed.

This second part closes with an admirable discussion of the Hedonistic controversy, a controversy so much in evidence throughout the history of ethics. There is here again revealed the same breadth of mind for which praise has been given in another connection. The truth in the theory is frankly accepted and admirably expounded. The failures and limitations of the theory are as ably presented.

We come now to part three which, I have before remarked, is *the* book. It frankly adopts the empirical position. There is neither revelation from Heaven, nor innate nor God-given inner faculty to guide man's way. He is as much discoverer and inventor in the control of human character and conduct, in the framing of custom and law, in the organization of society, as he is in the control of nature's material forces. And the end of ethics as a theoretical science, as its standard as a practical science, is no less objective than is the end in biology or the standard in physics. The difference resides in the immensely greater complexity of the phenomena, on the one hand, and, on the other, in the possible or even [and to the reviewer] probable presence of causally undetermined elements. These latter render the analysis of the phenomena not only more difficult, but, in the sense in which we have a science of physics, impossible. The furthestmost possible reach of the science can never be ultimate, only tentative and approximative. Its conclusions even so are those on which law and social control in all forms are based, though the open mind is forced upon us. This characteristic of open-mindedness of the wise man is nowhere more necessary than in this very field of ethical science and practise. We have in this science surely something solid on which to base our control, but that solid something may to a degree be changed at any given time in some indeterminable ways. The standard never can be finally and definitely fixed, but the direction of the movement can be definitely determined.

What has just been said is not put forth so much as an adequate summary of the book, as an indication of what the reviewer takes to be in the main the position of the author. And from an open-minded study of past history and present actual practise in morals, it seems to be the only tenable position on which the student of ethics can take his stand.

The exposition of this fundamental position of the author has some notable excellences. To begin with, there is the approach to the subject from the psychological point of view. This is in harmony with Professor Dewey's method in his course at Columbia on psychological ethics. You have here a frank adoption of the conclusions of Shand, Stout, and McDougall, of the existence in the mind of systems composed of original

instinctive impulses, which they call sentiments, in a technical sense. These may be thought of as structures which dispose to actions of thought, feeling, and conduct of certain forms. Without these structures there is no control, no ethical character or conduct. And it is the building up of these structures which constitutes moral evolution in the race, and moral education in the individual. The growth of a sentiment of abstract justice is the growth of conscience *par excellence*. You have in this way of viewing the phenomena a satisfactory account both of the nature and of the origin of conscience and of its variation from age to age and from man to man. Again the problem of morals presents itself to the author as one aspect of the general problem of values. The treatment is most interesting. Values arise out of and are determined by these structures named sentiments. So values change as these structures change, varying from age to age and from place to place. These structures are built up through social contacts and also in reference to the laws of nature. They are subject to criticism and open to experiment. Are not all positive laws and even customs to a certain degree experimental? In the last analysis these subjective structures which give values are objectively determined. Certain structures are favored over others because of consequences. So certain sentiments tend to disappear, others to persist. May not at last a system of sentiments arise, which gives a supreme value and in which all other values are involved as elements, a system of values in harmony at once with physical and human nature?

Just here the most interesting exposition of this theory of the author seems open to some criticism. He seems not to have carried his theory through consistently to its end. So there arises a certain confusion in the use of terms. Morality is used at times evidently with the meaning of *mores*. At other times it carries the meaning of morals proper. Thus when he discusses "The Significance of Morality for Society," morality evidently means *mores*. He starts off with the statement (p. 282), "It is a very old and trite observation that morality is of great advantage to any society." This puts the cart before the horse. What we mean by morality is that which is of advantage to society. Certain *mores*, accepted customs, and laws, may be found not to be of advantage to society and they become then immoral. Morality properly so called is critical of morality as custom and law. Its basis of criticism rests on what is of advantage at once to society and the individual. If we reserve the word morality for the technical meaning of *mores*, we might reserve ethics for the technical name for the growing theoretic science of a progressive standard both for social organization, and for individual character and conduct.

Again it sometimes appears as though morality were used to name one among several coordinate obligations. Doubtless as thought of by certain persons it seems to be such, as, for example, by those intellectual defectives, who talk about "art for art's sake," and who say morality has nothing to do with art. What may be called minor morals may have coordinate value with other human interests and may come into serious

conflict with them. But there is such a thing as major morality, which is the right organization of all impulses whether innate or acquired, whether of social or individual import. In itself it is comprehensive of life—the whole of life, and because it is the organization of life's many aspects into an harmonious unity, it is necessarily supreme, and all parts, aspects, or whatever you may call them, are but abstracts in this concrete whole. The supreme danger in ethics is thus abstraction, the reducing it from its imperial position to being but a one among many.

There had been marked for comment a certain lack of perspicuity in the treatment of conventionality, and a tendency to take that for obvious which is far from that to the ordinary undergraduate mind, for which the book is written. But when all is said there remains ground for abundant praise of the book. It is a strong stimulant to thinking, and will prove a valuable text-book in the hands of any instructor who is alive to real problems of ethics, with which the present times fairly bristle.

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What May I Hope? An Inquiry into the Sources and Reasonableness of the Hopes of Humanity, especially the Social and Religious. GEORGE TRUMBULL LADD. New York: Longmans, Green, and Company. 1915. Pp. xiii + 310.

This, the last of the four essays which together sum up the mature views of the Yale philosopher, adds little to our knowledge of his doctrine, or to contemporary thought. Written in his unfailingly urbane and soothing style, it is more than commonly vague, strung-out, and commonplace. There are occasional comments that one can relish and remember, such as the following: "How often, fortunately, are the 'by-products' of hope worth far more than any of its immediate and carefully planned satisfactions! The young man hopes for wealth or fame; he realizes habits of industry. He works seven years in joyful hope of Rachel; he gets Leah; but she is the better wife of the two" (p. 119). But such gleams are rare; and the general impression left upon the reader is of a monotonous, if exalted, seriousness. In part, at least, this may be due to the fact that there is really less to say on the subject of Hope than on the topics discussed in the other volumes of the series. We are here in the realm of sermonizing rather than of observation or logic.

The discussion begins with the psychology of hope-states; the complex emotion of hope is resolved into the three factors, desire, expectation, and trust, mingled in varying proportions. Thence we pass to a consideration of the ethical question, What hopes are morally legitimate, and what hopes vicious? The morally impermissible hopes are those based upon immoral desires; and since morality is the wisdom of life, these "immoral hopes are essentially foolish hopes" (p. 75).

When we pass from these preliminary considerations to the main question, What hopes are reasonable? we perceive at once that the answer is to be given in accordance with the results reached in the earlier volumes of the series. "These hopes find their solid ground in the fundamental and

undaunted faiths of morality and religion . . . They who hold these faiths base upon them the assurance of the hopes which foresee their fulfilment in the future of the individual and of the race" (p. 82). "Granting these faiths" (p. 253)—and they are for the most part taken for granted in this final volume—the reasonableness of the hopes follows. "The optimism which is the *hope* of a Divine Kingdom is dependent on the *belief* in the triumph of the moral ideals; this belief is founded on the *doctrine*, or intellectual faith—the reasoned conviction—as to the moral attributes of God" (pp. 300–301).

In addition, however, to this back-reference to the volume "What Should I Believe?" we have a strain of pragmatic argumentation clearly and insistently present. "Some hopes are peculiarly consonant with the spiritual and personal nature of man. They seem like almost indispensable factors in his personal life. For the best development of this life they are absolutely essential. They therefore carry a certain large weight of evidence in their own behalf. This is a truth to which we shall be obliged to refer again and again" (p. 34). "How then can it be maintained that the emotional element of trust which enters into certain faiths and hopes of the individual and of the race is without evidential value?" (p. 68). We even approach a point of view properly to be called mystical in such passages as "The convictions attaching to the hopes born of moral ideals . . . bear the mark of the not-to-be questioned authority of the Spirit from which they come, and to whose presence in the spirit of man and in the race they furnish an indubitable witness. Even to the onlooker, from the coldest and most non-sentimental and purely intellectual point of view, the self-evidencing authority of these hopes is worthy of no small regard" (pp. 83–84).

One chapter discusses the "lower forms of hoping"—hopes scientific, political, social. These, although commendable, and to a degree reasonable, are doomed to a relative disappointment except as they are leavened with a religious motive. A chapter apiece is devoted to the Hope of Moral Perfection, the Hope of Immortality, and the Hope of a Divine Kingdom—or regenerated social order—which are the three worthiest and most reasonable of human hopes. In regard to the first of these the pertinent consideration is emphasized that "it is by its very nature adapted to secure its own realization. . . . The hope of salvation is, in fact, a reasonable hope, because it is, in fact, an efficient hope" (pp. 184, 186).

The chapter on Immortality includes a lengthy discussion of the physiological arguments against it, which "ends, at the worst, in a drawn battle" (p. 241). The author's conclusion, that "the body is the temporary vehicle of the soul in the earlier stages of its journey, rather than its only and perishable but inescapable prison-house or home" (p. 224), is based "upon the faith in a Universe that is itself grounded in Moral Reason. The hope of immortal life for any particular individual depends upon his faith in God as the Redeemer of man" (p. 252).

Likewise, the hope of a Divine Kingdom is "based upon faith in God as the ideal—that is, the omnipresent, all-powerful, and ethically perfect—

Ruler of the Universe. . . . If there is no such God, there can be no hope for a social ideal" (p. 274).

It can readily be seen then that this little volume is a sort of practical corollary or epilogue to Professor Ladd's philosophy, and as such can not properly be criticized apart from a critique of his philosophy as a whole. That ambitious task the reviewer will not here attempt. It may be worth while to quote, however, from among the concluding words, the following: "The one word which has given the key to the 'substance of our doctrine' as to knowledge, duty, faith, and hope, is this,—*Personality* (or the *Personal Life*). It is shallow thoughts and frivolous emotions and evil practices gathered about the conception entertained in response to this word, that mar and spoil all the activities and issues of the life of the individual man" (p. 302).

DURANT DRAKE

VASSAR COLLEGE.

JOURNALS AND NEW BOOKS

THE BRITISH JOURNAL OF PSYCHOLOGY. May, 1916. *Stereoscopy, as a Purely Visual, Bisystemic, Integrative Process* (pp. 131-169): HENRY J. WATT. Stereoscopic vision is admitted to be a complex kind of sensory experience. A complete theory of it presupposes knowledge of its relation to its physical stimuli, of its dependence upon neural processes, and of its constitution as a complex experience. Stereoscopic vision may be collectively described as *an integrative complex of system forms* given either simultaneously in two different systems or successively in one and the same system. The writer's theory will serve as a basis and guide for the proper arrangement of the facts that lie psychically on the farther side of the purely visual process of stereoscopy. *Factors in the Mental Processes of School Children*, III: Factors concerned in the School Subjects (pp. 170-182): N. CAREY.—The examination marks of about 500 children ranging in age from 7 to 14 years in classes II to VII of the senior departments of four London County Council elementary schools. The results show in agreement with previous evidence the existence of a general factor. The motor is a large additional factor and the association between written words and their meanings is a small additional complication. *The Process of Negation* (pp. 183-211): A. W. WOLTERS.—The purpose of the investigation was to discover if there was any psychological distinction between the affirmative and negative judgment. Five varieties of tests were employed in the following order: (1) To apply an epithet to a noun, (2) to judge the correctness of a numerical statement, (3) to judge the correctness of a verbal statement, (4) to form a sensible and true proportion by supplying a predicate, (5) to judge the correctness of a picture. The writer concludes that there are two forms of negation—(1) Negatives of Construction, and, (2) Negatives of Denial. The cases are sufficient to show that the difference found between the two types is not merely the consequence of the experimental procedure, but is a real difference in mental activity. *A Further Note on the Sensory Character of Black* (pp.

212-221: JAMES WARD. - A rejoinder to Professor Titchener's reference to his article in the first volume of the *British Journal. An Experimental Study of Some Problems of Perceiving and Imaging* (pp. 222-266): F. C. BARTLETT. - The present study is concerned solely with ways in which adult subjects set about perceiving material of greater or less complexity that is presented to their observation, and with the factors determining these ways. The writer concludes that under many different conditions, and in many different forms, the fundamental "effect after meaning" is found. "At first, always, there must be immediately present sense experience, and then we have an act of perceiving." *Publications recently received. Proceedings of the British Psychological Society.*

Carlson, Anton Julius. *The Control of Hunger in Health and Disease.* Chicago: University of Chicago Press. 1916. Pp. vii + 319. \$2.00.

Jaini, Jagmenderlal. *Outlines of Jainism.* Cambridge: University of Cambridge Press. 1916. Pp. xi + 156. \$1.25.

Kehr, Marguerite Witmer. *The Doctrine of the Self in St. Augustine and Descartes.* Reprinted from the *Philosophical Review*, Vol. XXV., No. 4. 1916. Pp. 587-615.

Mignosi, Pietro. *La Tragedia del Pensiero: Discorso Introduttivo ad una Teoria della Conoscenza.* Palermo. 1916. Pp. 66.

Sidis, Boris. *The Causation and Treatment of Psychopathic Diseases.* Boston: Richard C. Badger. 1916. Pp. x + 418. \$2.50.

Woodbridge, Frederick J. E. *The Purpose of History.* New York: Columbia University Press. 1916. Pp. 89. \$1.00.

NOTES AND NEWS

FOR the academic year 1916-17 an exchange has been arranged between Professor Cassius J. Keyser, of the department of mathematics at Columbia University, and Professor Mellen W. Haskell, of the department of mathematics of the University of California.

DR. A. B. EDWARDS, of the University of Minnesota, has been appointed professor of psychology and education at the University of Georgia, to succeed Professor Geissler, who has been appointed professor of psychology and education at Clarke College.

DR. WALTER DILL SCOTT, professor of psychology at Northwestern University, is on leave of absence for the current year, acting as director of the Bureau of Salesmanship Research in the Carnegie Institute of Technology, Pittsburgh, Pa.

DR. ELIZABETH L. WOODS has been promoted to assistant professor of psychology at Vassar College.

MESSRS. CHARLES SCRIBNER'S SONS announce for early publication "Egotism in German Philosophy," by George Santayana.

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

BEHAVIOR AND THE CONCEPT OF MENTAL DISEASE

FOR some years I have been attempting to understand the physician's concept of mental diseases. Not long ago I had the pleasure of attending a medical meeting and of listening to a physician who has been very successful in his treatment of neurasthenia. Several cases of neurasthenia were described. Since none of the patients showed general organic disturbances of a serious kind and since all of the neurological tests showed normal functioning of the reflexes of the central nervous system, the physician concluded that the disease was "purely mental." He then began to describe the condition of such a patient's ego—the general content of consciousness, the inward reference of attention, and the peculiarities of the field of attention. At the end of his discourse two or three eminent physicians stated their satisfaction that the speaker had been willing to come out clearly and say that the disease was "mental." In other words, they expressed their approval of the fact that the speaker did not, in functional nervous cases, deem it necessary to find lesions in the central nervous system or even a toxic condition of the nervous system before admitting that the patient had a disease.

Being the only psychologist present, I did not like to admit that I did not understand the physician's use of the term "mental." (I do not wish by this assertion to stir up strife or bitter argument, but rather to confess ignorance on my own part and to seek for some common ground of discussion.) As a sequel to this meeting I began to attempt to formulate my own ideas as to the terminology I should use in describing a mental disease. I think that at the outset I should admit that I know a good deal more about terminology than I know about diseases of any kind. I am strengthened in this attempt to give my concept of mental diseases by the difficulty I have had in understanding the terminology (involving throughout and often transcending the current concept of consciousness) of the psychoanalytic movement.

I have been for some years an earnest student of Freud (and other psychoanalysts), but the further I go into their terminology

the more sure I am that there is a simpler way (and at the same time a more scientific) way of dealing with the essential factors in their theory. I am convinced of the value of Freud's work, but as I teach the Freudian method I drop out the crude vitalistic and psychological elements and stick to what I believe to be the biological and psychological theories (Freud himself admits the possibility of the truth that I think Freud has given us is that *the old and partially discarded habit and instinctive systems and possibly always do influence the function of the systems of reactions, and influence to a certain extent the possibility of our forming the new habit systems which are to be expected to form.*

To my students in psychology I usually introduce the terminology somewhat as follows:

Long before Freud's doctrine saw the light of day I gave the key to what I believe to be the true explanation. Thirty years ago he wrote: "... I am often conscious of standing by one of my selves and not the other. Not that I would not, if I could, be both hands and feet, dressed, and a great athlete, and make a million dollars a year, a *bon-vivant*, and a lady-killer, as well as a philanthropist, a statesman, a warrior, and African 'tone-poet,' and a saint. But the thing is simply impossible. The millionaire's work would run counter to the saint's and the philanthropist would trip each other up. The lady-killer could not well keep house in the same way. Such different characteristics may conceivably be alike *possible* to a man. But to make any of them rest must more or less be suppressed."

What James is particularly emphasizing here is that the organism is instinctively capable of developing many lines, but that due to the stress of civilization many of these instinctive capabilities must be thwarted. In addition, the habits which are instinctive and therefore hereditary, and the impulses which are equally strong and which must be given up. The systems of habits we form when we learn to perform, at four years of age will not be the same as those formed at the age of twelve, and those formed at the age of twelve will not be the same as those we become adults. As we pass from childhood to adulthood we are constantly giving up thousands of activities and muscular systems have learned to perform many things which have a tendency to perform. Some of the habits born with us are poor heritages; some of the habits

are equally poor possessions. But whether they are "good" or "bad" they must give way as we put on the habits required of adults. Some of them yield with difficulty and we often get badly twisted in attempting to put them away, as every psychiatric clinic can testify.¹

I then try to show that such habit systems need never have been "conscious" (and here all I mean by being "conscious"—and all I believe the psychopathologists mean by it—is that *the patient can not phrase in terms of words the habit twists which have become a part of his biological equipment*). The implication is clear that in the psychoneuroses I should look for *habit disturbances*—maladjustments—and should attempt to describe my findings in terms of the inadequacy of responses, of wrong responses, and of the complete lack of responses to the objects and situations in the daily life of the patient. I should likewise attempt to trace out the original conditions leading to maladjustment and the causes leading to its continuation. To these statements most psychopathologists will subscribe, but most of them will insist that maladjustments can not be stated wholly in behavior terms. It is just here that I think my difficulty in understanding the psychiatrist's position begins. I believe that the description of "mental" cases can be completed as well as begun in behavior terms.

I think the chief difficulty in completing the description in terms of the every-day language of habit formation lies in our failure to look upon *language* (the patient's here) as being only a system of motor habits. As a short cut—a system of economy—the human animal has formed a system of language habits (spoken words, inner speech, etc.). These language habits are built up from and always correspond more or less closely to the general system of bodily habits (I contrast here for convenience of expression *language habits* and *bodily habits*) such as the eye-hand, ear-hand, etc., systems of coordination and their complex integrations. This general correspondence between language and bodily habits is shown clearly in the football field, where we see the player making a complex series of movements and later hear him stating in words what systems of plays he employed; and in the case where we hear a man tell us what acts he is going to perform on a horizontal bar and later see him executing these acts. Words have grown up around motor acts and have no functional significance apart from their connection with motor acts. I have come recently to the view that speech should be looked upon as a vast system of *conditioned reflexes*. In a previous paper² I sketched the method of establishing motor and secretory conditioned reflexes. As Pawlow and Bechterew have shown,

¹ From a written but unpublished lecture.

² "The Place of the Conditioned Reflex in Psychology," *Psychological Review*, March, 1916.

the central feature of the method consists in the fact that almost any stimulus can, under suitable conditions, *be substituted for another stimulus* which has a very definite act of its own as a consequence. An electric contact applied to the sole of the foot will produce a defensive reflex—a jerking up of the foot. A monochromatic light produces no such effect. If, however, the light is allowed to fall upon the retina of the eye at the moment the foot is stimulated electrically, we will (after repetition) bring about a condition such that the light alone will produce the defensive reaction of the foot. Words as words are learned largely by imitation, but words receive their standing as functional units in integrated habit systems by virtue of the fact that they become *substitutable for the stimulus which originally initiated an act*. A simple illustration will possibly serve to make clear my point. The cold air from an open window leads a child who has gone to bed to draw up the covers. The words of the nurse “cover up, dear” will lead to the same act. Of course in habit systems as complex as those in speech, words get further and further divorced from the original stimuli for which they were substituted (*i. e.*, from the original integrations in which they first played a part). The final test of all words, however, is the question whether they can stand adequately (be substituted) for acts. We often see an instructor despair of telling a student in words how to conduct an experiment. He then resorts to acts and goes through the experiment for the student. Our words thus stand as a kind of shorthand sketch of our repertoire of acts and motor attitudes.

I have developed these points at length because a great many of the symptoms of so-called mental cases consist in disturbances of speech functions—in maladjustments of that nice balance which should exist between speech acts and bodily acts (and, perhaps even more, disturbances among the “speech functions” themselves). For fear that I may be misunderstood in my use of the term “disturbance” of speech I wish to say that I have no reference here to aphasia. I mean, among other things, by speech disturbance what the Freudian means: For example, in the manifest content of dreams one finds new words, misplacement of words, condensation of words, etc.; and in the association test the failure of words and an increased reaction time between stimulus word and response. These are speech disturbances and hence *habit disturbances*, exactly on a par with the paralysis of arm or leg in hysteria, defensive reactions, compensatory reactions, and the like. All such disturbances of habit—superfluous and useless conditioned reflexes—may be found to date back to some primary stimulus (possibly to sex trauma, exposure,³ masturbation,

³ I believe it takes more than a single shock or disturbance to bring such conditional reflexes in its train. Usually I believe it is a long-continued struggle with environment which brings them.

etc., in childhood) which is the conditioning cause operating just as the electric shock given jointly with a visual stimulus operates in forcing the visual stimulus finally to release a group of responses which, until the current was applied, brought none of them.

Motor tics, the seeming paralysis in hysteria, etc., are to be envisaged in the same way; as types of conditioned reflexes, which are no more wonderful and no less wonderful than the cases in the laboratory where the sound of a bell does not at first cause a subject to jerk back his arm, but which later comes to do it after we have jointly stimulated the hand with an electric current and the ear with the bell. Nor will the objection hold that conditioned reflexes arise only in the laboratory. Dr. Lashley has shown that numerous such conditioned reflexes exist in the functioning of the parotid gland in man, and that these reflexes arise in the regular course of daily activity. So pronounced are they that a subject can not very well experiment upon himself. If he reaches forward to get a pipette full of acid to test its effect in increasing the activity of the gland, the gland begins to function as he reaches for the acid. Now if conditioned reflexes can arise in the salivary gland, they can and possibly do arise in all glandular and muscular portions of the body. The possibility that tics and hysterical manifestations generally arise in this way is very great. It seems to me to be the only biological formulation possible in the present state of our knowledge.

Is it not simpler, then, to look upon all such manifestations as special forms of conditioned reflexes? As long as they do not disturb the subject's ordinary reactions to the objects around him, we do not class the patient as being "mentally" disturbed (as in the psychopathological disturbances we see in daily life); the moment, however, that an arm is incapacitated or the glandular and muscular elements of the sex organs become involved we must take notice of such grave disturbances and try to see what can be done. If now we can take what appears to me to be a sensible point of view about language habits ("thought") and come to look upon them as obeying the laws of all other habits, and describe our patient's symptoms wholly in terms of habit disturbance, and trace the conditions which have led to the disturbance, we shall have come a long way. We could throw overboard the enormous and burdensome terminology of a description in terms of consciousness—disturbances of the affections, misplacement or withdrawal of the libido (a concept which, in Jung's latest book on the "Subconscious," has become the equivalent of Driesch's *entelechy*), repressions into the subconscious, and the like.

I think I can illustrate what I mean by describing a hypothetical "neurasthenic dog." Suppose I take a dog to a canine psychiatric

clinic and tell the physician nothing about the dog's previous history. The physician puts the dog through a searching neurological examination, makes a thorough test of heart action, examines the urine, etc. Absolutely no pathological disturbances are found. He finds, however, on testing the dog's reactions to his normal canine environment that there are serious functional disturbances. When the normal dog sees a piece of red meat, he snaps at it. The "neurasthenic" dog, however, lies down and becomes absolutely motionless. When brought near a female of his own kind, far from exhibiting the usual reactions, he begins to shed tears. When spoken to in gentle tones, he hangs his head, puts his tail between his legs, but when spoken to gruffly he brightens up and lifts his head and licks the speaker's hand. When preparing to sleep, instead of turning round and round and lying down with anterior and posterior ends in close relations, the dog jumps up and down and finally lies down on his back with his paws pointing to the stars. The physician surely finds here serious conflict with reality and a woeful lack of normal compensations. But since there are no organic pathological disturbances, the physician diagnoses the case as neurasthenia with compulsion neurosis—the disease is mental.

When I come to the clinic and see the physician and talk with him I explain that there is no need to introduce any concept of the "mental," I tell him that I have *trained the dog* during the past five years to do just these things. The trouble with the dog is that his habits are twisted. Now if I had started with a dog whose instinctive reaction systems were (possibly) perverted in the beginning (heredity) and I had superposed in addition the above bizarre group of habit reactions, he would seem a pitiful object indeed when trying to cope with his environment.

Now as to the cure of the dog. I should begin step by step to *retrain* the dog along lines which would make him better fitted to cope with his environment. If there were sufficient plasticity left I should undertake it with a good deal of hope. The length of time required for the cure and the rapidity of the cure would depend upon several factors—such as my luck in fixing upon just the right method for breaking up the old non-serviceable habits, the length of time the old habits had been in force, upon the tractability of the dog, etc.

If I understand their teachings, this cure which I suggest is the keynote of the work of the psychopathologists. It is certainly that of Adolf Meyer. I doubt if Dr. Meyer will go as far as I do in holding that the time has already come for describing "mental diseases" wholly in terms of twisted habits, and yet it was a conversation which I had with him three or four years ago that first led me to think

over functional nervous cases in this way. Nor can I see where the straight Freudian adherents can have any cause for complaint. Every psychopathologist begins with a conversation with his patient. In the conversation certain words begin to give indications of the "complex" (maladjustment). The habit twist is made still clearer by the results of tests with the word-association method, by the analysis of the patient's dreams, by inference, and by common-sense observations. In course of time the maladjustment is completely located, and its origin, development, and consequences are fully traced. Now during the process of study, the patient's reeducation (usually, but not necessarily, along sex lines) has already begun. In fact it began the moment the physician secured sufficient acquaintance with the patient to begin analysis. (Brill states that he will not attempt analysis until he has known the patient for at least a week.)

Several psychopathologists have thought that the objective methods and terminology which we have sought to introduce would necessarily do away with conversation with the patient. This is not true. Speech is just as objective as tennis-playing or any other muscular act and should be looked upon in just as objective a way. The difficulty has been that instead of looking at speech as at other muscular acts, we have looked upon it as a revealer of "thought"—the sacred inner secret of the "mind." Now in testing out a neurasthenic patient one of the first things we do is to find out what disturbances there are in the movements of hands, arms, and body as a whole. We watch and describe them in wholly objective ways. Is it not possible to look upon speech disturbances in just such an objective way and see in them merely signals which will lead us to the disturbed systems of bodily integrations? In a particular case we may find (without admitting that we must find it so) that the speech defects point to the "incest complex" in one form or another. The faulty and unwise behavior of a mother has led the boy to react to her in many particulars as does her husband. Such a group of integrations on the boy's part seriously disturbs the forming of suitable boyish habits and may bring in its train a vast series of conditioned reflexes which may show themselves in general bodily disturbances, such as tics, paralysis, etc., or in speech defects, such as failures in word responses, lengthened reaction time, etc.

My thesis so far has concerned itself with *motor habits*. The muscles form only a part of the total reaction system. Every motor reaction calls for a simultaneous response in the glandular system (corresponding in part at least to the *affective values* of the psychologists and psychopathologists). Now the chief symptom in many cases of mental disease is the disturbance of "affective values" (withdrawal of the libido, etc.). It is to take account of this puzzling

transfer that has led the Freudian school to speak as though the "affective process" could be disembodied from any particular response and hang suspended as it were in mid-air⁴ (the "subconscious" is introduced here by Freud). From time to time, to be sure, it attaches itself to certain responses, but these responses may bear no relation to the original stimulus which called it forth.

The modern notion of emotional⁵ reactions calls first for the presence of an emotionally exciting stimulus, which will, through hereditary mechanisms, excite neural arcs leading through the central and the autonomic systems, finally arousing activity in the glands—especially in the ductless glands. The latter then set free certain substances, *e. g.*, adrenin, among other things, which, on getting into the blood, continue the emotional activity just as though the original stimulus were present. As I view the matter we have here just the situation for arousing *conditioned emotional reflexes*. Any stimulus (non-emotional) which immediately (or shortly) follows an emotionally exciting stimulus produces its motor reaction before the emotional effects of the original stimulus have died down. A transfer (conditioned reflex) takes place (after many such occurrences) so that in the end the second stimulus produces in its train now not only its proper group of motor integrations, but an emotional set which *belonged originally to another stimulus*. To apply this in detail in functional cases oversteps my ability as well as my present interests. At any rate the suggestion seems to me to give a reasonable clue as to the way in which such shifts in the emotional constituents of a total integration can occur. Surely it is better to use even this crude formulation than to describe the phenomenon as is done in the current psychoanalytic treatises. What is simpler than to speak of a transferred or conditioned emotional response, giving both the

⁴ I quote from Ernest Jones who is interpreting Freud's theory of affective processes: "Most significant, however, is the assumption that it has a certain autonomy, so that it can become released from the idea to which it was primarily attached, thus entering into new psychical systems and producing widespread effects. This displacement of affect from one idea to another Freud denotes as transference (*Uebertragung*), and says that the second idea may in a sense be termed a representative of the first. A simple illustration of the process is when a girl transfers the affective process properly belonging to a baby to that of a doll, and even takes it to bed with her and makes attempts to feed it, thus treating it in all possible respects as she would a baby." *Papers on Psycho-Analysis*.

⁵ I prefer to keep the term "emotion" in objective psychology. I, however, throw away all of the conscious implications. To me an emotion is a bodily state which can be observed in man and animal equally well, such as the bristling of hair, shedding of tears, increase or decrease in respiration, sighing, heightened muscular activity, and the like. Some day we shall be able to mark off these objective states and classify them with respect to the types of stimuli which call them out (sex, food, shelter, noxious odors, etc.).

object (or situation) which originally called out the emotional response and the object (or situation) to which it was transferred?

In conclusion I wish to say that I am not attempting to launch criticisms at the head of the psychopathologist. If his terminology is involved it is the fault really of psychology, since he perforce had to use the concepts which psychology had developed. I have tried in this paper merely to raise the question whether the psychopathologist can not reshape to some extent his formulation of problems (without doing injustice to the patient) so as to avail himself of biological and behavioristic concepts.

Psychological terminology is, I believe, being fast outgrown. Dunlap's recent inquiry^a into the definitions of psychological terms shows, I believe, more clearly than I can state, just how little agreement there is among psychologists in the use of common psychological terms. It seems to me to be a mistake for as useful and fascinating a growth as psychopathology to allow itself to become encrusted with the barnacles of an outgrown terminology.

JOHN B. WATSON

JOHNS HOPKINS UNIVERSITY.

PHILOSOPHIC FORMALISM AND SCIENTIFIC IMAGINATION¹

I

THE art of mathematics possesses so compact a neatness, is so harmonious a union of fluidity and rigidity, that it exercises a hypnotic fascination over all types of mind. The philosopher's preoccupation with it, since Pythagoras, his abortive attempts to impart its form to his themes, are notorious. It manifests such a magic precision, such an ineluctable definiteness, such a so-ness, that the uninitiate stand in awe, and the initiate find it the quintessence of those conditions which satisfy our sentiment of rationality: it supplies activity without frustration, plurality without confusion, unity without monotony. As Mr. Bertrand Russell says, "Mathematics take us still further from what is human, into the region of absolute necessity, to which not only the actual world, but every possible world, must conform; and even here it builds a habitation, or rather finds a habitation eternally standing where our ideals are fully satisfied and our best hopes are not thwarted." Again: "the world of pure reason

^a Knight Dunlap, "The Results of a Questionary on Psychological Terminology," *Johns Hopkins Circular*, 1916, No. 5.

¹ A review of "The Concept of Consciousness." Edwin B. Holt. London: George Allen and Company, Ltd. 1914. Pp. xix + 343.

[i. e., of mathematics] knows no compromise, no barrier to the creative activity embodied in passionate aspirations after the perfect forms of springs. Remote from human passions, remote from laws of nature, the generations have gradually created a cosmos where pure thought can dwell as it will, where one, at least, of our nobler impulses can find an exile of the actual world."

Mr. Russell, it happens, is not merely a philosopher of mathematics. He is also a mathematician who brings to his labors that neo-realism is indebted for its vigor and its dogmatic bias. His passionate utterance of this thing, willy-nilly cathedral for a school becoming an absolute necessity, to which not only the actual world but the world must conform." The mood is not limited to mathematics ever. It is the mood of all metaphysical sects, the exteriorization of that inward passion for unity. The "logical motive" in human nature, of whose origin and function the systems of tradition are the striking outcome. A mathematician like myself might point out that there is something about this motive and its satisfactions, that it is not for in terms of definite vital needs and operations. It is that mathematics and philosophy are merely a few highly specialized media, but otherwise typical expressions of the appetites of our common nature. But then I suspect I exhibit very little understanding of the "logical motive," tempted to desist. I note curiously, however, that the idea of form and of absolute necessity does not seem to be honestly facing data and seeking to account for them. The gospel of the logic of mathematics is preached in mathematics by quite other men, and that neo-realism is really a systematic metaphysic, has its St. Paul and its Christ. Thus the organizer of neo-realistic salvation seems to be

Mr. Holt appears to possess what Mr. Russell has not. He has, I suspect, a scientific and romantic, as against a formalist, an imagination alive to the experiences of the last century, the motives of men. The combination of this imaginative passion and the slang of philosophical mathematics is at his hands, in a genuine system which throws the tradition into a fresh perspective and enriches the tradition with a new picture. The manner of it, if one bear in mind the manner of Bergson, is distinctly cubistic, and "the neutral mind" the total of Being in Mr. Holt's thought is a concept of the mind perforce to "the nude walking down the stairs."

that picture, you see, there really isn't any nude and there really isn't any staircase: there are only angles of illumination meeting other angles of illumination in specific ways; and if you observe the meeting in one of those specific ways, you have a nude walking down a staircase, but if you observe it in another of the specific ways, you have a staircase walking up a nude. The difference derives from the relations, not the terms: the terms are neither nude, nor staircase; they are purely neutral angles of light.

I do not wish to appear to put the position with undue levity. The analogy seems to me to express adequately the problem which Mr. Holt's intention and procedure raise. His intention is to deduce consciousness from a few elemental somethings that are not consciousness. His procedure is to develop it from a few primitive logico-mathematical postulates that "imply it," just as the triangularity of a triangle implies that the sum of its angles is equal to two right angles. In doing so he borrows his units from logic; whatever is, must be a term, or a relation, or a proposition: he traverses the whole expanse of existence, in its depth and in its breadth: he reviews and summarily dismisses most of the historic portraits of the universe he does not like: he reinterprets and makes use of a number of postulated conceptions, such as "logical change," "specific response," and "universal," in a fresh and exciting way. Withal, he manages to keep close enough to the data of the laboratory to give his speculations the air of factual plausibility as well as consistency, and he does it in a manner somewhat staccato and shrill, but lively and colorful enough to make it a style. When you have mastered his rather perverse vocabulary and have learned to know the usual things by their new unusual names, you find a really intelligible vision which adds a new dimension and a liberating perspective to the actualities of the daily life, like a landscape in a dining-room.

Nature appears in this perspective as a self-generating hierarchy, moving from the simple to the complex; from the one or the few, to the many; from the "neutral" to the psychical and material; from the indifferent to the valuable. It has a structure which the order of the sciences echoes. For they also move from simple to complex and constitute a deductive hierarchy, wherein the series from colors, sounds, and the other secondary qualities, through geometry, mathematics, physics, chemistry, geography, astronomy, biology, psychology, sociology, economics, the theory of values, all derive from the simple entities of logic, which are the walls of the world and the foundations of reality. They constitute an asymmetrical deductive series, of which the more complex presupposes the less complex, equivalent to it in being and dependent upon it for its distinguishing traits. Consciousness, the domain of psychology, belongs to the most

complex and superficial of the syntheses of neutrals, so that the definition of the "concept of consciousness" is impossible in terms less than the whole metaphysical system from which it is to be "deduced." That system is implied, but not achieved. Mr. Holt is perforce compelled to content himself with deducing consciousness from those "entities in the neutral series that are simpler and more fundamental than minds," that "immediately precede in point of simplicity." Now there exist "physical objects—organic and inorganic entities, both living and dead." These are composed of simpler, neutral entities. They environ the living organisms which respond specifically to some of their neutral constituents and not to others. Such response delimits a field of neutral beings which compose a definite and particular "cross-section" of that being. The field so delimited is consciousness. "In fine the consciousness that depends on any given living organism is the sum-total of all neutral entities to which that living organism responds, and it is the system of these entities in just such and such quantity and just such and such spatial and temporal arrangement of the environment as the responses themselves define."

II

The character of Mr. Holt's method and the significance of his deductions cause the validity of this definition to depend inevitably upon the validity of the concepts from which it is generated. His dialectic seems to me to support its whole movement upon the three notions: (1) "logical activity," (2) "universal," (3) "specific response." These are his fundamental postulates. Without them the differentiating dogmas of neo-realism, declaring consciousness to be an external relation and thought and thing numerically identical, could not emerge. They are the "indefinables" of the system, and their compatibility and validity determine that of the system. For this reason I shall consider them alone, and in the order named, rather than the system as a whole.

1. "Logical activity," Mr. Holt writes, "does not of course involve time; but time involves it, being a special case thereof." What is called "logical necessity" is similarly derivative and secondary, designating merely the correspondence between the thinker and that which is and always was. "Given a surface and the formula of any curve, however complicated, and the entire curve forthwith is: and the geometer follows after with his deductive thought to learn what this is." But what is an activity such that antecedent and consequent are simultaneous? Not, obviously, one involving what is usually meant by activity—duration and change, a strain of succession between the prior and the subsequent. It is identical with what is ordinarily meant by "implication." A proposition and its implicates are simul-

taneous and instantaneous. One implies and posits all; all imply and posit one. The mere being of "simples" is thus necessarily coincident with their combination into all sorts of complexes. There can be no possibilities, no potentialities in Mr. Holt's world. All is actual, the water which may result from the still uncombined hydrogen and oxygen, the chicken from the still unhatched and perhaps never to be hatched egg. Activity, change, time, in the usual signification of these terms are purely illusions, being definable by means of instantaneous and simultaneous relations of *before* and *after* (Royce, *idem*) merely, in which things past and things to come stand to each other from all eternity. The geometer *following* "with his deductive thought" is unthinkable in a world that merely *is*. Contradiction, in the discussion of which Mr. Holt has shown much acumen and originality as well as perversity, is no less impossible, and with it error of the Holtian kind, and other things dear to the neo-realists. For Holt insists that contradictions *emerge*, that they are not instantaneous, but eventual: "a set of contradictory propositions need not be utterly contradictory; it may generate a considerable system of terms in relation before the contradiction is at all manifest, as is shown by the fact that the logician often proceeds for some time in the deduction of a system of terms in relation from a set of postulates, until at some point the propositions *meet* in contradiction. Nor is it through any error of deduction that the contradiction was not earlier." Earlier! Logically or temporally earlier? Surely "logical priority" is temporal instantaneity, yet if the phrases quoted mean anything, they mean that there has been a lapse, a stretch, and that something which was not, has become. Holt's notion of activity, in a word, shifts from the meaning he assigns it to the meaning it ordinarily has, and its use to designate real processes, such as the emergence of contradictions does greater credit to his common-sense than his consistency. Observation of analogous data led Russell to distinguish between relations as terms, and relations as "relating"—*relations inert*, in a word, and relations in action, a distinction ultimately, and ultimate, between *being*, and *doing*. Formally, Holt's procedure not only uses, it requires, this distinction. His assumption is, however, that propositions or relations (he identified the two) are inseparable from their activity. If, on the other hand, he concedes them to be separable, then activity becomes a quality which accrues to propositions independently, a quality entirely detachable from them, contingent and non-implicative: Being, being inert, is self-consistent. The result is a dilemma: either activity can not be the ground of deductive necessity or contradictions are subjective illusions.

The ambiguity of meaning in Holt's use of the term activity is

still clearer in his discussion of the knowledge of past time, that is, of memory; and of future time. Since, in his system, the idea and object are identical, present knowledge of a past event can not be anything less than knowledge of an event *going on now*. Similarly, knowledge of the future is the being *now*, of *something which is not yet*. Consequently, past and future either both are and are not, are experienced as "B-not-B," which "no one ever experienced," or there is a genuine difference between knowledge and its object, and *meaning* is an activity other than merely logical implication. Underlying the ambiguity is, of course, a formal staticism, which has denatured activity, and has ignored the genuine character of temporality and substituted for it the spatial relationships of *before* and *after*. Since you can distinguish a row of simultaneous objects as before and after each other, and since this seems all that remains when the *generative process* which so posited the objects is ignored, time gets identified with *nothing but* this spatial series and the epistemological trick is turned. So Noah building his ark has a position "in" time "before" Caesar building his bridge identically as 2 has a position in the number system before 3 and after 1. *Before* and *after* have thus no other designable content than *in front* and *behind*: "the relation of the knowledge system to time is precisely what it is to space." Proof: you can ignore the temporality of an event and deal with its spatiality. Then you can attribute, without further examination, the discoveries in the one field as traits to the other. Thus, you declare that response to the past is the same as response to distance. You demonstrate the identity by example, so: "if the auditory stimulus of the name of a person who is dead causes a nervous system . . . to produce tears, it is by no means the mere acoustical energy transmitted to the ear that has done this; but a highly peculiar arrangement of nervous arcs that were so organized by past events, it is so-to-say 'stored stimuli,' which only this peculiar configuration of acoustic energies could now set in action. . . . The present response is then not solely a function of the present stimulus, but of past stimuli as well; it is, and will ever continue to be, a revived response to past stimuli." A past stimulus, please note, is one which no longer stimulates. Either, therefore, the past stimuli are identical with and present as "stored stimuli," hence not past at all, or the "stored stimuli" are different from the stimuli that *caused* the storing. Whichever be the case, the response is immediate and present to immediate and present stimuli. Otherwise, logic requires us to be responding to the identical stimuli, once directly present, now long past, which moved our quadrumanous ancestors. If this be so, why do we not know those entities as such, and know them, moreover, as *past*?

All in all, the notion of "logical activity" can not be said to yield the neo-realist any advantage. Strict adherence to it does not abolish the traditional distinctions between appearance and reality, thoughts and things; it only stretches the gulf between them wider, redoubling the force of the traditional problems of philosophy. This, however, is the precise eventuality neo-realism seeks to prevent. The difference between appearance and reality, it holds, is *nil*; the difference between thoughts and things is *nil*; the genuine efficacy of causes is *nil*. All being reduces to coordinations of immutable, self-repeated simples; all action to instantaneity of concomitant invariant variations. The world is petrified, and plurality, motion, change, and life have still to be accounted for.

2. What is invoked to account for them, in addition to "logical activity," is the universal. This, with its peculiar relation to the particular, is the second of Mr. Holt's necessary indefinables. The upshot of his exposition may be summarized as follows. What distinguishes a universal from a particular or individual is its constant duplicability, or rather, self-duplication. An individual is a "this and no other," so defined by its position in a system. A universal is not. A universal is, in Royce's phrase, "self-representative, and in such a way that the relations between itself and its otherselves are internal to their terms." This internality is implied in the very law of identity, "A is A" so that the factual character of the universal is the "repetition of identicals." It possesses a "deductive fecundity" and constitutes thereby "the sole *connected meaning* of the 'living' whole." It is a genetic formula which generates the many from itself by repeating itself. Every "proposition" or relation is a universal, the terms it posits being dependent upon it for their being. It is their essence, their "connected meaning," internal to them and constituting them. "And so far as any of the terms are related to one another, it is because their being is not independent, although the terms are distinct, but is *generated* by the logical activity of a proposition." "Universal" and "logical activity" are, it will be seen, co-implicative. I am not sure that Holt's exposition permits us to conceive of any important difference between them. "Logical activity" appears nowhere save as an acting of universals, and the very definition of "universal" requires the notion of activity.

Thus, epistemologically, the red sunset in my dream of a sunset I saw last summer in the mountains is a repetition of the same identical system of propositions that generated the sunset itself. It is not an "idea" of the sunset, nor an image, nor a representation, but the thing itself, more or less. In the world of the physicist the fall of a feather and the movement of the moon are reduplications of the identical generative formula that propelled the apple upon Newton's

cranium. Immanent in these diverse items are "eternally valid and simultaneously predetermined aspects" which "you must not confuse with the temporal succession of your verifications of the order." The foregoing quotation is from Royce, whose essay (the Supplementary, at the end of "The World and the Individual") Holt acknowledges as the correct basis for his definition of the "universal." The warning contained in the quotation he ignores, however, as he must, being a realist, and the result is the emergence of self-contradiction, of that B-not-B which "no one has ever experienced" and the possibility of which Holt denies.

For example: two particles, in motion, generated by the logical activity of an identical proposition of dynamics, and repeating this identical like two Dromios, encounter in space. At the point where both motions disappear, contradiction is. Holt speaks of it (pp. 272-279) as if it were mere contradiction or opposition, and not *self-contradiction*: "To be sure the unthinkable does not happen among objects, nor yet indeed does any one subjectively think it; no single particle moves in opposite directions at once, and this is also meaningless. The contradiction is, of course, between *propositions*; which are in the present case expressed as *equations of motion*." Note the plurals. They indicate that Holt is thinking, not logically, but intelligently. For if his description of the universal and its relation to its instances is correct, then the contradictory equations and propositions are not two but one, not different but identical. In the collision, one and the same dynamic law, confronted with itself as its complete, self-representative double, negates itself. O shade of Hegel! this is what comes from declaring numerical diversity and other diversities irrelevant, and irrelevant they must be, since it is the identical proposition that *operates*. If now as we must further assume, this proposition, being eternal, goes on operating although it has contradicted itself, there is no logical reason why the particle on which it acts should not move in opposite directions at once. This may be meaningless, but it is logical. As Holt does in point of fact prefer meaning something to being logical, his actual treatment of the matter does implicitly assume that the differences—differences in locus, differences in function, differences in origin—are operative and important, because they actually *make* a difference. This being the case, what, once more, becomes of the identity of appearance and reality, of thought and thing?

3. The "thing" is, according to Holt, a more or less complicated aggregate of neutral entities which constitute an object in the physical world when defined by one generative proposition, and an object in the mental world or consciousness when responded to with a specific response by an aggregate defined by another generative propo-

sition so as to mate up a living body with a nervous system. The identical aggregate figures in the two systems at the same time without being in any way altered by either. Its differentia as consciousness is a nervous system's *specific response* to it.

In many ways, this notion of "specific response" is begged. It is the last of the necessary indefinables in the Holtian system. Complex as it is, it should have been "deduced," by way of "logical activity" and "universal," but it is arrived at empirically, on observational, not imaginative, grounds, and although it logically depends upon, it is treated as coordinate with, those notions, whose chief function in the "concept of consciousness" is to serve the demonstration of the immanence of past and future in present knowledge, and of the objectivity of error. "Specific response" involves difficulties peculiar to itself.

Holt finds its beginnings in the tropisms of plant-life and its culmination in the simple or complicated reflex movements of animal life. The reflex-arc, which is its "physiological or functional unit," is, in its anatomical essentials, the same in animals and plants. It is the basic mechanism of response, "further differentiated and wonderfully coordinated in a nervous system." Each reflex-arc corresponds strictly and specifically, both alone and in its integration with its fellow reflex-arcs in the nervous system, to definite and specific items of environment. The correspondence is a one-one correspondence, fixed and predeterminate for each and every arc and each and every integration of such arcs. This is why the response is *specific response*. The manner of it constitutes the knowing process.

"Specific response," it will be seen, is a concept which extends the field of consciousness to the vegetable world. Stopping with the vegetable world is, however, purely arbitrary. From the reflexes of protoplasm to the reflexes of preprotoplasmic matter, of colloids, of crystals, of what not, is an easy and inevitable step. In fact, the world is just chuck full of specific responses that inanimate entities exhibit toward each other—the specific affinities of chemicals, the specific reverberations of resonators, the specific reflections of mirrors, and so on. Can it then be said that the difference between the vital and the non-vital, the conscious and the unconscious, lies in the specificity of its response to its environment, or in the complexity of the specifications? And inasmuch as the complexity is purely structural, it can hardly be declared to introduce anything new or different. If consciousness is no more than the specific response of one neutral entity or a collection of such to another or to a collection of others, consciousness can not be denied any entity namable. The logical upshot is an inverted panpsychism.

Now an inverted panpsychism is no more than a restatement of

the problem. Consciousness being an entity of any kind specifically responded to by an entity of the same or another kind, the definition and identification of that familiar *quale* which science, dialectic, and the daily life know as consciousness, needs still to be made. Its nature and differentiae are not designated by, even though they may have been grounded in, the notion of specific response. Grant that "specific response" is the cause or basis of consciousness, it is as perverting to identify it with consciousness as such as it is to identify the specific response of hydrogen to oxygen with water as such, or ether vibrations with light. Water and light are just what hydrogen and oxygen and ether-vibrations are not; they possess qualitative characters quite different from, and in the very least additive to the latter: and their nature lies in those characters and in nothing else besides.

I can not help thinking, hence, that this bold and imaginative attempt to analyze away the genuine differentiae of consciousness is due not so much to observation as to reaction against the excesses of subjectivism and the clumsy difficulties of representativist theories of knowledge. Reaction against subjectivism has led to a pan-objectivism, in fact to a panic-objectivism, by way of an attenuation of all cases of consciousness to a purely external relation and of the formulation of self-contradictory conceptions of "activity" and "universal." Activity is conceived, as we have noted, as eternalist and static; the universal as self-repetitive, so that the sameness which two instances of a quality or proposition possess is a Platonic sameness. The difficulties of representationism are involved ultimately in psychophysical parallelism. Reaction against that leads to the identification of "thought" and "thing." But neither parallelism nor representationism is escaped in this way. They are merely restated and obscured in new terms. Analysis reveals, as Mr. Lowenthal has shown,² a parallelism closely resembling Spinoza's, and a *de facto* dualism in which identity is actually established by an *identification*, such that the content of consciousness is a process of meaning and its object a thing meant. Their eventual coalescence through verification is then defined retrospectively as identity. The slurring is made possible by notions of "universal" and "activity," which enable Holt to regard them as one and not two even when they *are* two, and so to discount their *becoming* one.

I respond, let us say, in memory, specifically, to a certain continental town. There exists then a one-one correspondence between the constituent reflex-arcs of my responsive mechanism and certain predetermined entities of the town's aggregate, which are thereby my consciousness. The relationship is static, coordinative, not causal. Neither I nor the town is altered in any way thereby. What-

² This JOURNAL, Vol. XII., pp. 703 *seq.*

ever changes the reflexes of my nervous system may undergo, are changes that belong in a series other than those neutral entities to which it responds, and conversely. Nervous system and field of response do not cause each other to change; they change *with* each other. This is nothing if not parallelism, and parallelism and representationism it must be. For consider: "The little group of neutral entities which is the intersection of the 'actual town' and of 'actual space' with the recalling consciousness, and which, while remaining identically itself, is a member of both systems, has two positions,—one in the spatial manifold, and one in the conscious or knowledge-manifold." Now by virtue of these *two* positions the *identical* group may undergo changes in either which will not affect it in the other. The little group of neutral entities may be destroyed in the spatial manifold, yet remain whole in the knowledge manifold, and *vice versa*. Thus they may both be and not be at the same time. Then either idea and object are empirically different from one another, but capable by a process of verification of merging into one another, or they are the same, but immobile and indestructible, and defined differently by different "generative propositions" as "things" and "thoughts." The consequences of the latter alternative are, however, a static universe, and a rigid panpsychistic parallelism.

I have said enough. That the "concept of consciousness" does not turn out complete fiction is only an indication that its author was after all too sensitive to the data of immediate experience to carry out his method implacably to the end. His book is far from the consistent deductive system he meant it to be. As it develops, its general outline gets filled with the living detail of acute observation and suggestive hypothesis; his terms regain their customary meanings, and his subject-matter its customary semblance. The passion for logic becomes checked and overlaid by an equally strong passion for fact; consistency gets swamped by correctness. The result is an imaginative distortion of reality of much beauty, some scientific worth, and great freshness and originality. To keep his system on the level of science Mr. Holt would need to acknowledge the human bias in its formulation, and to regard it simply as another instrument in the organization and control of the data of experience. He would, in a word, need to adopt the position of the pragmatists.

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REVIEWS AND ABSTRACTS OF LITERATURE

What is Living and What is Dead of the Philosophy of Hegel. BENEDDETTO CROCE. Translated by DOUGLAS AINSLIE. London: Macmillan and Company, 1915. Pp. xviii + 217.

Of the faithfulness of the translation the present reviewer is not competent to speak; he will therefore endeavor only to estimate the value for metaphysics of Signor Croce's contribution. As the title indicates, the author's aim is more than historical; it is, in the broader sense of the term, critical. He believes—doubtless rightly—that certain errors and excesses have not prevented Hegel's system from affording fundamental truths. What then, in his view, are these truths? The first concerns method. "Hegel is one of those philosophers who have made not only immediate reality, but philosophy itself the object of their thought, thus contributing to elaborate a *logic of philosophy*. I believe, therefore, that the logic of philosophy (with the consequences ensuing from it for the solution of particular problems and for the conception of life) was the goal to which the main effort of his mind was directed" (p. 1). "In any case the hope of understanding and of judging the work of Hegel is vain, if we do not always keep clearly before the mind that this problem . . . was his main and principal problem, the central problem of the 'Phenomenology of Spirit,' and of the new forms assumed by this book in the 'Science of Logic' and in the 'Encyclopedia of Philosophical Science'" (p. 5). In these statements it is difficult, we must admit, to see more than a concession to the subjective bias of present-day philosophy. If the "logic of philosophy" is aught but an account of the ways in which we *do* think, it would seem that it can be only an account of the ways in which we *ought* to think; and what is that, in Hegel's view, but the description of the way reality is constituted? There is no apparent advantage in putting the matter in terms of methodology and the subjective, rather than in terms of the nature of ultimate reality. The distinction of Hegel from most of the philosophers of his own and succeeding periods lay in his objective-mindedness. And if he, too, being modern, sometimes failed to preserve the distinction, let us not forget that he made it. We can not but feel that in this point Signor Croce has a little obscured one of the vital things in Hegel.

But let us pass to the further fundamental truths. "Above all, what should be made clear is the triple character that philosophic thought [we should prefer to say, reality] assumes in Hegel. . . . Philosophical thought is for Hegel: firstly, concept; secondly, universal; thirdly, concrete" (p. 5). "And in order to elucidate this triple difference, . . . it would be necessary to include in a complete exposition the minor doctrines, which are attached to the first and fundamental doctrine, some of which are of great importance, such as the resumption of the ontological argument (the defence of Saint Anselm against Kant), which maintains that in the philosophic concept, as distinct and different from mere representations of particulars, essence implies existence. Another is . . ." etc., etc. (pp.

7-8). "But it is not my intention to offer in these pages a complete exposition of Hegel's system, nor even of his logical doctrine; but rather to concentrate all attention upon the most characteristic part of his thought, upon the new aspects of truth revealed by him, and upon the errors which he allowed to persist or in which he became entangled. For this reason, then, I set aside the various theses briefly mentioned above . . . and I come without further ado to the point around which all the disputes have been kindled and against which his opponents have aimed their direct denials—the treatment of the problem of *opposites*" (p. 9). This is the famous "dialectic"; and the author is occupied for the rest of the book with the endeavor to show that while the dialectic is true and lasting, yet as used by Hegel it contains a confusion which has rendered much of the system fantastic and sterile. The exposition, after preliminary and rather general statements of the confusion in the first three chapters, traces its consequences in the seven succeeding, with a concluding summary chapter entitled "The Criticism and Continuation of the Thought of Hegel."

On the whole, the exposition seems cast a little more in the poetic than in the logical mold; one might even complain of vagueness here and there. In consequence, the reviewer feels that he may not have caught the ideas of the author, and may hope in case of error to be corrected. The main point seems to be that while the dialectic is true of certain aspects of reality which are distinct but not opposed, it does not hold of certain others which are distinct and opposed. Thus, "fancy" and "intellect" (p. 9) are distinct from each other, yet each works with the other, helping to express the other, and both combine in a true Hegelian synthesis or organic unity. That is, "two distinct concepts unite with one another, although they are distinct; but two opposite concepts seem to exclude one another [the "one another" is perhaps the translator's fault] (p. 10). "But examples of opposite concepts are drawn from those numerous couples of words, of which our language is full and which certainly do not constitute peaceable and friendly couples. Such are the antitheses of *true* and *false*, of *good* and *evil*, . . . *positive* and *negative*, *life* and *death*, *being* and *not-being*, and so on" (pp. 10-11). Now the distinct things can unite as they are; the opposites can not unite except as there occurs process, change, becoming. For change is a combination of being and not-being, yet in a sense different from that in which mind is a combination of fancy and intellect. The two modes of combination are as divergent as dynamic and static. "The opposites are opposed to one another, but they are not opposed to unity. For true and concrete unity is nothing but the unity, or synthesis, of opposites. It is not immobility, it is movement. It is not fixity, but development" (pp. 19-20). And "the concrete universal, with its synthesis of opposites, expresses life and not the corpse of life; it gives the *physiology*, not the *anatomy*, of the real" (p. 21). The dialectic is dynamic as well as static, but it has a distinct meaning in each of these. The opposites are but abstractions, having no concrete existence; the distinct aspects or stages have concrete existence. Being and non-being are never themselves found in experience; becoming alone is the

certainly should not be expounded or criticized in that manner. We can not but think that the Italian author, gifted as he undoubtedly is in sympathetic insight, would have contributed more to progress in metaphysics, if he had connected his account of the dialectic with some of the more recent logical discussions of relation contributed by France, England, and America.

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A Theory of Time and Space. A. A. ROBB. Cambridge, England: University Press. 1914. Pp. vi + 373.

This book represents an attempt to discuss the theory of relativity from a mathematical standpoint by deriving the formal properties which space and time possess, according to this theory, from a set of postulates concerning the relation of temporal succession. It has been recognized for some years that there is no method by which we can discriminate between the electromagnetic or optical properties of a system at absolute rest and those of a system moving at a constant velocity. The famous experiment of Michelson and Morley destroyed almost the last hope of discovering, by electromagnetic or optical means, the direction and magnitude of the absolute velocity of a point on the surface of the earth, and suggested very strongly that *no difference whatever* could be found between the electromagnetic formulæ of a fixed system and those of one moving without acceleration. This gave Einstein the idea that there might, after all, be no difference between absolute rest and unaccelerated motion, and that what is now regarded as a system of fixed axes of coordinates with reference to which we determine the direction and magnitude of a motion may, from another equally valid standpoint, be regarded as moving with a constant velocity with reference to another set of axes of coordinates which, from this standpoint, are regarded as fixed. These interrelations of the velocity of a system and the position of what we take as our standard axes of coordinates turn out, according to the laws of optics, to be such as can not be expressed except by supposing that space and time are not independent, and that we can not say that two events are simultaneous without involving some reference to the positions of these two events in space, or to some physical magnitude, such as a velocity, which can only be defined in terms both of spatial and of temporal entities. Certain analytical formulæ have been found, which express those essential connections which must subsist between the spatial relations of an event and its temporal relations, unless there is some reason for regarding rest as intrinsically different from unaccelerated motion—and no experiment has been found which enables us to distinguish between these two states. Now, this interdependence of time and space can not be expressed in terms of these two principles, as we ordinarily conceive them, in such a manner that time constitutes a dimension of Being independent of the three dimensions of ordinary space. It is consequently necessary to give a new formal analysis of the four-dimensional manifold constituted by time and space together. Two methods of carrying out this analysis have been

suggested: one is that of Einstein, while the other is that developed by Robb in this book.

Einstein "made the suggestion that events might be simultaneous to one observer, but not to another,"¹ and developed a theory of the relation between space and time on this basis. Robb rejects this view, since, he claims, it conflicts with the logical fact that "a thing can not both be and not be at the same time." His rejection rests on a misinterpretation of what is meant by this statement. "At the same time" is simply a metaphor for "taken in the same sense and under the same conditions," and has nothing in particular to do with time. If to say that the event X occurs at the moment indicated by the event Y in the system of time measured with respect to the set of coordinate axes S expresses a different condition concerning X than to say that X is simultaneous with Y with reference to a set of axes T , there is no reason why the maxim cited by Robb should demand that the truth of one of these statements should imply that of the other. If, on the other hand, we accept the truth of the statement that "a thing can not both be and not be at the same time," we must accept this as a physical hypothesis, and not as a logical fact, and it is just as capable of correction and rejection in the course of our further study of physics as any of the other apparent truisms that have been discarded by the upholders of the theory of relativity.

Instead of attempting, like Einstein, to approach the problem of the relation between time and space by allowing the simultaneity of two events to depend upon the set of coordinates chosen as fixed, Robb bases his theory of space and time upon the relation of temporal succession. This, unlike Einstein, he regards as absolute: that is, he holds that if an event in time follows another, it does so without any reference to a set of fixed coordinates. He consequently escapes from the difficulty which he finds in the work of Einstein. To this relation of temporal succession he gives a physical interpretation essentially optical in nature: one instant follows another if a flash of light starting at the second can reach the first either directly or after reflection. An instant in this sense corresponds not to what we should ordinarily regard as an instant, but to an instant *at a particular point in space*. Robb phrases his definition of an instant in a manner somewhat more general than that in which I have just stated it: he says, "If an instant B be distinct from an instant A , then B will be said to be *after* A , if, and only if, it be abstractly possible for a person, at the instant A , to produce an effect at the instant B " (p. 7). This is rather awkwardly put. Entirely apart from the utterly needless introduction of the notion of a "person," it presupposes that we have a fixed and definite notion of what is meant by "causation," not to speak of "the abstract possibility of causation." It is fairly obvious that the notion of causation is at least as obscure as that of time, and that a theory which so radically upsets our established notions of time as the theory of relativity does can not but cause an equally great modification in our views on causality. However, while these alterations in our theory of time have been

¹ Robb, p. 2.

systematized and organized by the very people who have brought them about, the corresponding work has not been done with the theory of causality. It is indeed much more natural to define causality in terms of time than it is to define time in terms of causality.

What an "abstract possibility of causation" is, I do not know, and I doubt if the phrase has any clear and definite meaning whatever. In any case, Robb defines *ignotum per ignotius*.

While the philosophical basis of Robb's work is rather unsatisfactory, his book has an unquestionably great philosophical significance. That space and time form a system such that neither can be studied without reference to the other, while it is already brought out in the work of Einstein, receives much greater prominence in that of Robb, owing to the fact that he develops a theory of pure mathematics on the basis of a set of postulates which is at once spatial and temporal, which embraces both pure geometry and what may be called rational chronology; in which, however, these two elements can not be separated. Robb has at once made the consideration of space necessary in the discussion of the relation of time to experience, and forged an instrument which enables us to carry out this joint consideration of space and of time. To an even greater extent than Einstein, he has made it obvious that the two problems of Kant's "Transcendental Esthetic" are really but two aspects of a single problem. Furthermore, as a by-product of this philosophical task, he has created a new branch of mathematics of a very considerable intrinsic interest.

Of the technical development of the book one can only speak with the greatest admiration. As has been said, the relation of temporal succession is taken as the primitive idea. This is regarded as asymmetrical and transitive, but not as connected: that is, of two distinct instants, one need not follow the other. However, of a set of instants that represent the successive positions of a particle, one must precede or follow any other, so that the time-path of a particle is serial in character and, in general, has all those formal properties that we normally predicate of time. The relation of temporal succession is closely analogous to that of a cone *A*, with a vertical axis and a certain given vertical angle, to another such cone *B*, when the vertex of *A* lies on or within the upper nappe of *B*. Most of the postulates in the book apply to this relation among cones as well as to the relation of succession among instants. These postulates are well chosen, and for the most part satisfy the condition of independence. The various forms of the notions which he calls by the names of line, plane, and three-fold are developed in terms of the relation of succession among instants, and finally a theory of measurement entirely dependent on the relation of temporal succession, and on that alone, is given, which is such that the fundamental formulæ of the theory of relativity, as developed by Einstein and Minkowski, result solely from Robb's postulates.

NORBERT WIENER.

HARVARD UNIVERSITY.

The Investigation of Mind in Animals. E. M. SMITH. Cambridge: University Press, 1915. Pp. ix + 194.

Anything approaching a complete system of animal psychology is well-nigh impossible at present in face of the conflicting interpretations of even the simplest reactions and the lack of evidence upon the mechanism of more complex behavior. At best one can but adopt a point of view borrowed either from physiology or from human subjective psychology, and this necessarily determines the direction of interest and colors the interpretation of experimental data. In his discussion of animal behavior Smith distinctly takes the subjective viewpoint; his problems have to do less with the causal analysis of the animal's reaction than with the value of behavior as evidence for the presence of consciousness in its various disguises as images, ideas, intelligence. In a book purporting to present in brief the "aims, trend, and the general nature of the results" of animal psychology this seems a rather restricted outlook. Certainly many investigators will not agree that the subjective interpretation of behavior data is the chief business of the science; indeed, not a few are inclined to deny that this problem is a legitimate one. In the hands of Watson, Pawlow, and others the study of animals has been of prime importance in encouraging the demand for a strictly physiological analysis of the activities even of man and in discrediting the utility of "psychic causality" as a scientific instrument. Problems such as the reflex nature of instinct, the mechanism of learning, and the physiology of reinforcement and inhibition in conditioned reflexes are among the most important contributions of the study of animals and should scarcely be omitted even from a popular exposition of the aims of animal psychology, yet one finds no mention of them in this volume.

I do not wish to leave the impression that the book is wholly given up to a discussion of consciousness in animals. On the contrary, very little actual space is given to the question, and interesting and critical reviews of recent experimental work make up the greater part of the text. The presentation of the methods most generally employed in behavior studies is excellent, particularly in the chapters devoted to learning. Here good criticisms of the technique of maze, problem-box, and discrimination methods are given with a review of the difficulties met in the study of sensory physiology by the discrimination and conditioned reflex methods. The first chapter considers the questions of plasticity of reaction and habit formation in protozoa. Here the author seemingly overlooks the work of Metalnikow, which is the best positive evidence that we have. The treatment of instincts is especially interesting, including an account of the relations between stimulus and instinctive reaction which give the latter plasticity, and correlating Cunningham's theory of hormones with periodic instincts. A special chapter is devoted to homing, which gives a good account of the more important studies and theories dealing with this instinct. Many experiments on imitation are reviewed and the final chapter is devoted to the methods which have been used to judge the degree of complexity of habits which the animal can form.

The book is designed primarily for the non-technical reader, is simply and clearly written, and reflects the careful, critical attitude of the best experimental studies. But here again the limitations of the subjective viewpoint are evident in that no answer is given to the first question of every lay reader: "What is the use of all this?" The practical contributions of animal psychology considered as the study of "mind" in animals are difficult to find. The book is too brief to serve as a text, but should prove useful as supplementary reading in introductory courses where little time can be given to animal behavior.

K. S. LASHLEY.

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JOURNALS AND NEW BOOKS

REVUE DE MÉTAPHYSIQUE ET DE MORALE. March, 1916. *Quatre nouveaux manuscrits inédits publiés par P. Tisserand* (pp. 295-330). MAIN DE BIRAN.—These manuscripts are (1) Reflections on the General Forces which Animate Nature, (2) Psychological Notes, (3) Magnetism and Somnambulism, (4) On the Analytic Method. *L'Arithmétique et la théorie de la connaissance* (pp. 331-342). L. BRUNSCHVIEG.—"Arithmetic, although wholly rational, or more exactly because it is wholly rational, is an instrument which is forged through contact with experience and which does not cease to sharpen itself by this contact." *La Sophistique. Étude de philosophie comparée* (pp. 343-362). MASSON-OURSEL.—Sophistic thought is a characteristic of certain periods in every civilization. Its appearances in Greece, India, and China are compared. *Études critiques. Un essai de Psychologie historique: William Godwin*: DOLLÉANS. *Questions pratiques. Guerre et Morale*: D. PARODI.

Heathcote, Charles William. *The Essentials of Religious Education*. Boston: Sherman, French, and Company. 1916. Pp. 290. \$1.50.

Philosophie Religieuse et Pratique: Ses Bases, Règles et Conséquences. 2 Vols. Paris: Girard et Brière. 1915. Pp. 638 and 563.

Rousseau, Jean Jacques. *Political Writings*. Edited from the Original Manuscripts and Authentic Editions with Introductions and Notes by C. E. Vaughan. 2 Vols. Cambridge: University Press; New York: G. P. Putnam's Sons. 1915. Pp. xix + 516 and 577. \$18.50.

Seashore, Carl E. *Vocational Guidance in Music*. University of Iowa Monographs, First Series, No. 2. Iowa City. 1916. Pp. 11.

NOTES AND NEWS

TO THE EDITORS OF THE JOURNAL OF PHILOSOPHY, PSYCHOLOGY, AND SCIENTIFIC METHODS:

IN an article in this JOURNAL¹ Professor Warren, replying to Professor Moore and defending his own anti-teleological beliefs, points out an ambiguity in the term chance. Popularly it is often used to denote "an uncaused result"; and Professor Warren, like every other observant man, dismisses such a fancy. But there is also "a legitimate scientific use of the term chance." "When one meets a friend 'by chance,' we suppose two separate series of events each of which by itself is causally determined; but the conjunction of the two series at this particular point is not the result of either set of causes."

Of what, then, is it the result? Has Professor Warren considered how wide a door he opens here for escape from a mechanic universe? This doctrine does not easily harmonize with his previous profoundly interesting papers, but on the contrary provides all the room for "purpose" which any wise teleologist could desire. Wherever chance may be, without disturbing "regulated causation," these foreseen adjustments might equally well be. To adopt such a notion of chance is to confine the work of "science" to tracing lines of causal sequence, while at the same time acknowledging that these by no means fully explain our hourly happenings. I have no desire to argue the point, having already devoted a chapter to it in my "Problem of Freedom," published five years ago. I would merely call attention to Professor Warren's admirable definition of chance and note how well it provides independent spheres of influence for teleology and mechanism. In entire agreement with it, I formerly wrote, "The world is full of accidents. Its faults struggle and conflict and ignore one another and demonstrate how far it is from being a complete organic whole. It is an error to speak of the world as ruled by law; it is ruled by laws, each pretty regardless of its neighbor. Everywhere it is the business of mind to bring these laws into cooperation. The world's melodies, its ties of succession, are due to its own mechanism; its harmonies are either ethical or accidental."²

Very truly yours,
G. H. PALMER.

HARVARD UNIVERSITY,
September 5, 1916.

THE Section of Anthropology and Psychology of the New York Academy of Sciences met on October 23 in conjunction with the American Ethnological Society at the American Museum of Natural History. The following papers were read: "Social Organization of the Arizona Apache," Dr. Pliny Goddard; "The Hopi Clan," Dr. Robert H. Lowie.

¹ Vol. XIII., p. 441.

² "The Problem of Freedom," p. 139.

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

SENSATION AND PERCEPTION

II. THE ANALYTIC RELATION

THE preceding article on the genetic relation of sensation to perception contained a criticism of the doctrine that sensations are genetically prior to perceptions and form the raw material of the latter, together with a presentation of the alternative doctrine that the capacity for experiencing qualitatively distinct sensations is conditioned by the functional differentiation of the sensory centers in the cortex, and is thus a product of the same process of development that issues in the formation of perceptions. I wish now to consider more fully what the conditions are which determine the experiencing of specific sensations, and how such experience is related to perception. The inquiry of the present paper is directed not so much to determine on what the general *capacity* for sensation depends, as to determine the conditions under which sensations actually are experienced. It is thus the problem of the analytic relationship of sensation to perception with which we are to deal. In this field, as elsewhere, it is to be expected that genetic and analytic investigations will be of mutual service.

If we compare sensation with perception in their relation to behavior we find ourselves at once face to face with a striking and fundamental difference. The sensation has no direct relationship at all to behavior. Sensation-qualities in themselves call for nothing determinate in the way of response. Whiteness, pressure, warmth, *C*, may lead us to practically any sort of response of which we are capable; but what particular response, or modification of response, any one of them actually calls out depends, in the first place, upon the objective whole to which it belongs, and, in the second place, on the situation. Abstracted from an object and isolated from a situation, it leaves us perfectly indifferent as to how we shall act. It is indeterminate in its relation to behavior. Perception, on the other hand, being the apprehension or awareness of an *object*, stands in a determinate, albeit indirectly determinate, relation to behavior. If there is no one inevitable response to an apple, a dog, a tree, or a

man, there is at least a set of alternative possible modes of response within which the actual response will probably fall. Our customary and appropriate ways of treating an apple are characteristically different from our customary and appropriate ways of treating a dog, or a man. Just what particular response is demanded by an object on any given occasion depends on the situation of which the object is a constituent or factor. As a matter of fact, it is just this characteristic relationship to behavior which constitutes the very essence of objectivity. A certain complex of nervous excitations, *e. g.*, the "visual appearance," the "smell," the "feel" of the apple, have become organized into a percept solely through the fact that they have come to call out a distinctive sort of behavior, have become coordinated into a functional whole. So again, a complex group of retinal excitations become organized into a visual perception of an apple because it has come to function as a whole in determining response.

The same contrast between sensation and perception appears again if we compare the properties of things which are most clearly related to simple sensation qualities—as color—with those properties which are apprehended through perception, as shape and size. Generally speaking, there is no sort of behavior which is demanded by blue objects, or by objects which feel "cold," or taste "sour." The shapes of things, on the contrary, and their sizes, demand appropriate treatment. If you take hold of a square-cornered object, you grasp it differently, and handle it differently, from the way you grasp and handle a round object. Similarly with its size and weight and position. These all call for a fairly definite set of possible muscular adjustments.

The fact that sensation stands toward behavior in so different a relationship from that of the percept is of the utmost significance for an adequate theory as to the place and function of sensation in experience. It is really this fact of the functional indeterminateness, or what we may call the *functional independence*, of the sensation which enables the psychologist to treat the sensation as a structural element, a simple process which has no meaning, and which by itself can (as Professor Titchener says) do nothing but go on. It is from this central fact of its functional indeterminateness that we must interpret the doctrine that the sensation is an element into which the so-called perceptual complex may be resolved, and in terms of which it is to be construed, a doctrine hopelessly unintelligible from the conventional standpoint of analytic psychology.

The difficulties in the traditional treatment of the sensation as an element I have discussed in a former article.¹ It may, however, be worth while to consider them further in the present connection.

¹ "The Psychological Element," *The Phil. Rev.*, July, 1915.

According to the current doctrine we never experience a sensation "pure" or by itself, but always as a constituent or factor in a complex. We are, however, led to believe that there are such things as sensations because, when one of these complexes is analyzed by introspection, we find ourselves able to attend to color quality, or pressure quality, or tone quality, in disregard of the fact that it is the color of a piece of paper, or the pressure of a pencil, or the tone of an organ. However, this simple sensation, thus isolated by attention, is experienced as somehow different, by virtue of the very fact of attention. The sensation as it really is in the complex can be known only by analogy to the sensation as isolated by analysis. For this reason the sensation is said to be an abstraction, or an artifact, comparable to the atom or the ion, an existent, that is, which is postulated for the purposes of scientific construction. Now any whole, whether it be a loaf of cake, an engine, or the human body, is analyzed into constituents or factors solely in so far as these constituents may be conceived to enable us to account for the properties and behavior of *that whole*. In order to meet this requirement, the elements found, or postulated, must themselves have definite properties, and such properties as can account for the properties of the whole. Thus the properties postulated of the ion, or discovered to belong to the cell, are relevant to the properties of the atom or to those of the organism, and help us to understand these latter. It is only as the bearer of these relevant properties, indeed, that the ion is postulated at all, and the same may be said in its turn of the atom. But in the case of the sensation the situation is altogether different. The sensation, even if the psychologist could consent to accept it as an entity capable of behavior, has no known properties or modes of behavior which help us to understand the complexes into which it enters. It is in itself, indeed, merely an hypostatized *quality*. The properties or characteristics of the complex are not conceivable as resultants or products of the joint activity of the constituent sensations. The one salient feature of the percept, that which makes it a whole—namely, that it is meaningful—is quite unaccountable so long as we treat it as a "complex" of sensations. No scientific doctrine was ever more futile or barren of results than this doctrine that the percept is a complex of sensations.

The only ground for supposing that perceptions contain sensation elements at all is the fact that if a given perception is lost under certain circumstances, when, as the psychologist says, it is "pulled to pieces" by psychological analysis, we experience determinate sensation qualities. Now it is only metaphorically that we can speak of "pulling a perception to pieces," or "breaking it up," or even of "analyzing" it into elements. For in the very act of performing

the "analysis" the perception disappears. It is not that the whole is destroyed as a result of the analysis, as always happens as the result of any analysis, but that in the very shift of attention necessary to introspection the perception has vanished utterly. We no longer "see" or "feel" or "hear" the object, but only variegated patches of color and the pull of eye-muscles, or the coldness and pressure and strain, or shrill sounds and beats. The assumption that these are to be identified as elements of the perception which preceded them and which we may alternate with the perceived object at will, rests on a very natural confusion. The continuity exists solely in the *objective conditions*, and the only intelligible identity is that of the *external stimulus* now and then. Indeed, it may be asserted that the only identity ever recognized, or that we are capable of recognizing, is an identity of reference. If there be such a thing as a purely existential identity between the content of one moment's experience and that of the next, it certainly does not obtain in this case.

In thus urging that psychological analysis is not an analysis of a psychical complex, I am not arguing for a view like that held by William James, that it is an analysis of the object. For the sensation "elements" reached are no more truly elements of the object than of the percept. Take the case of a visual perception. My hat lies on the desk before me. Looking "at" it, I put myself in the attitude of the psychological observer. The familiar hat disappears and I see an area of markedly variegated browns and grays and blacks and flecks of brightness, with another equally, but differently, variegated mass rising at one end. Now these patches of differing color I should never think of attributing to my hat as "its" color or colors. I distinctly see grays and blacks; but my hat is a uniform *brown* of rough straw, with a darker *brown* feather; and if I were to "match" the straw or the feather with silk or velvet, I should never think of looking for such a mass of variegated tints and hues. Furthermore, the difference in shade which I attribute to the straw and feather as really "their" difference in shade, is not to be identified with the difference between any one of the patches of color in the mass at the end (the feather) and any one of the patches of the main mass (the straw). It is literally true that when I am looking for the contrast between straw and feather I do not see these patches, just as when I see these patches I do not see the "real" color of straw and feather. Again, in the dark I pick up an object and recognize it as this same hat by its familiar rough texture and flexible shape. But if, as I pick it up, I introspect, and note the varying pressures, and even pains, and the pull of muscles, these sensation qualities I can not conceivably attribute to the hat as making up its roughness and

shape. In these so-called cases of analysis, we are not, strictly speaking, "analyzing" at all, for the elements we come out with are not truly elements or factors of any whole, either objective or subjective. What has happened is that *the same objective stimuli are being responded to differently* on the two occasions. There is indeed a sameness, an identity there, but it is an identity, not in what I *perceive*, but in what I know by reflection to be there.

If the preceding contentions are just, it follows that sensations are analytic elements of our experience only in a very unusual and questionable sense. The doctrine, indeed, that they are results of analysis is but the counterpart of the time-honored doctrine that perceptions are the products of a synthesis conceived either as an organizing act of the mind, or as a structure produced by the associative agency of the elements themselves. There was a time—and the tendency still lingers in some quarters—when perception was regarded as a sort of condensed or sub-conscious inference operating on given and immediate matter or data of sense. Nowadays no one with psychological training would dream of so interpreting it. So far as adult experience, at least, goes, it is the perception which psychology regards as immediate and given, and the sensation which is the artifact. And yet the perception is nevertheless believed to have been generated by the organization of such given material of sense, and to remain existentially a complex of such elements in spite of its immediacy for our experience.

This doctrine, that sensations are existentially present in perception, like the doctrine that they are present in the infant's experience, has as one of its main supports the doctrine of specific energy. According to this doctrine, in its most generally accepted form, the different end-organs are normally excitable only by their own peculiar modes of external stimuli, and on transmitting the excitation thus produced to their respective cortical cells, mediate invariably their own peculiar sensation qualities. This being so, it follows that when a number of cortical cells are stimulated simultaneously (in such a way that coordinated functioning occurs) the perception mediated is a *complex*, containing these specific sensation qualities, slightly modified perhaps by their mutual interaction, but maintaining their essential specificities.

Now the essential inadequacy of the doctrine of specific energy one would suppose to have been made sufficiently manifest in Professor Dewey's article, "The Reflex Arc Concept," nearly twenty years ago. It surely is a doctrine which runs counter to the whole trend of present-day psychophysical interpretation. As Professor Dewey so forcibly urged, the reflex arc, from stimulus received to response evoked, is one unitary act or functioning of the nervous sys-

tem. There is no possible reason for cutting the act in two and treating the passage of the excitation to sensory area in the cortex as an event by itself. As a purely mechanical process in space and time it may be regarded as a single event, but as forming a part of the behavior of a conscious being it is no event, nor any intelligible factor in such behavior. As well try to construct the human body from "elements" obtained by a process of repeated bisection, as to construct perceptual experience in terms of specific energies.

The psychological weakness of the doctrine of specific energy shows itself when the attempt is made to interpret in its terms the facts of attention. So far as direct observation shows, whether I see the blueness (or the blackness) of the ink with which my friend's letter is written, depends on whether I am attending to the color. I am very likely to read the letter in complete obliviousness to the color of the ink—I literally do not *see* the color, and if I try to remember afterward, I have not the faintest memory of it. And yet my reading the letter depended on the excitation of "blue" retinal end-organs and the transmission of this excitation to the proper cortical cells. According to the psychologist, this phenomenon is due to inattention and is explained thus: Even though I do not attend to the color of the ink, yet I am, nevertheless, experiencing the sensation "blue" as I look at the letter. The sensation which I have is in the *margin* of attention, but it is the same sensation which I should have if I attended to the color, and the sensation occupied the *center* of attention. The marginal sensation differs from the focal sensation in the attribute of "clearness" only, but this does not, it is assumed, alter its identity. But now let us ask what evidence can be brought forward to support this interpretation. What empirical grounds are there for the assumption that I was experiencing inattentively the sensation blue, when I read the letter? If introspection is to be relied upon, one must conclude that I had no experience of blue. As a matter of fact, the theory is confessedly beyond the reach of empirical verification, for the so-called marginal content is admitted to be open to memory-recall in the lowest degree.

A similar case is that of the hearing of the overtones in the notes of a violin or of a flute. I hear the notes of the violin and of the flute as distinctly different. After the proper training I can, when I attend, hear out the overtones which give each its characteristic quality. But what evidence is this that I was all along hearing (inattentively) these same tones? I should have said before my training that the difference between the violin tone and the flute tone was a simple difference comparable to that between red and orange. To suppose that nevertheless the content of my perception was an existential complex containing these overtones as elements is a per-

fectly gratuitous assumption, which raises vicious epistemological problems and explains nothing. To attribute the experienced difference between violin and flute to the experiencing of different sensations is in principle no better than Descartes's theory of vision, in which he explained the perceived difference in distance between two objects seen, in terms of the angles made by the lines of sight from the two eyes. Doubtless it is true that if the angles were not different in the two cases, the objects would not appear to be at different distances; and doubtless if the notes of the violin and flute were not objectively complexes containing the overtones they do, they would not appear as qualitatively different. But the latter is as irrelevant as the former, when used as a *psychological* account of the difference. Nor is the case altered because under the proper conditions I can *hear* the overtones, whereas I can never directly *see* the angles. The "proper conditions" (trained attention) are as necessary conditions of my hearing the overtones, as is the existence of the specific air-waves, or the stimulation of the auditory end-organs.

The theory then has the weakness of assuming existents lying beyond the reach of empirical verification. But as a conceptual construction it is equally open to criticism. The chief difference alleged to exist between the marginal and focal sensation is a difference of "clearness," which is accordingly treated as one of the "attributes" of sensation. But the *existent*, as such, can not be more or less clear. It is only of *meanings* that clearness is predicable. The essential attribute of the sensation is its quality—in fact, as has already been remarked, the sensation is nothing more nor less than an hypostatized *quality*. The attribution of clearness to the sensation seems to be due to an inevitable confusion arising from the attempt to treat experience in terms of the existential. I look at the wall-paper inattentively, and am able a moment afterward to recall its color vaguely as "gray," but what sort of gray—whether light or dark, yellowish or bluish—I am entirely unable to tell. The unclearness is truly predicable of my experience, if the experience is taken as a sensation of a determinate gray. One might describe it as *meaning* gray, and then the unclearness could be attributed to it. But the psychologist is forced by his presuppositions to suppose that my sensation, i. e., an existent whose essence is quality, existed as an *indeterminate* gray—a patent logical absurdity.

And this brings us to the heart of the discussion. So far I have argued that, on the one hand, it is theoretically unfruitful to regard the sensation as an element of the percept conceived as an existential complex; and, on the other hand, that there is no empirical evidence possible for such a doctrine. Furthermore I have criticized the doctrine of specific energy in its commonly accepted form, urging

that the experiencing of sensation-qualities depends as much on the condition of attention as on the stimulation of the appropriate end-organs and sensory cells, *i. e.*, on the part which the stimulated sensory cells play in determining the response. Not every discharge of a given set of sensory cells in the cortex yields the specific sensation-quality they are capable of mediating. The problem then is: Under what conditions are these sensation-qualities experienced, and how are these conditions related to the conditions under which perception occurs?

As has already been asserted, the point of departure for a theory of perception is the relation of sensation to behavior. Psychophysically this means that it is to the mode of functioning of the sensory cells of the cortex that we must look to discover the conditions of sensation. From the outset of conscious life in the individual the functioning of the nervous system is marked by the presence of inherited functional systems, the operation of which we call instincts. And just as the evolution of behavior takes place through the mutual inhibition and modification of instincts, so the complicated functioning of the nervous system which constitutes the conscious behavior of the adult has developed through the growing differentiation and coordination of the inherited functional systems. Thus it remains true that every nervous functioning is the functioning of *a system*. The discharge of cells in the sensory cells never dissipates itself indifferently, but always tends to follow some more or less determinate path or system of paths. Just what system of paths, and what particular path within that system will be chosen, depends on the attentive "set" of the cortex, as well as on the particular combination of sensory stimuli received in the various centers. The response, that is, is never a response to a single stimulus, or to a single object, but is always a response to the situation. Completely uncoordinated response is abnormal response. Stimuli are truly stimuli only in so far as they are coordinated. The normal nervous system is incapable of acting except through the operation of functional systems, mutually inhibiting, facilitating, and modifying each other in their action. We never perceive anything entirely unfamiliar; every sight and sound and feeling, however strange, has some character which places it for us, if only by its demand for further specific examination.

From the start, anything which acts as a stimulus at all tends to evoke some response. In the preceding article it was argued that just as the early responses are vague and uncertain, so the early stimuli must be experienced as correspondingly vague and indefinite. The adaptation of response to stimulus is rough, being direct and simple instead of indirect and complex. Just as the chick pecks at

any small moving object, so the baby grasps at practically anything within its reach. But with the growth of the power of varied manipulation comes a new ability to discriminate between visual stimuli. Let us consider what this means in terms of nervous functioning.

At first the group of sensory cells in the visual area, for example, possesses a minimum of differentiation. The excitation of all alike is connected with responses controlling eye-movements. But soon there arises a differentiation of cells due to differences in retinal stimulation correlated with differences in location of the source of stimulation—the object seen. The child learns to turn eyes and head left or right, up or down, to look *at* the attractive light or object, as well as to fixate it for clear vision. This differentiation of the sensory cells of the visual center can, of course, develop only in coordination with muscular stimuli due to movements of eye and head muscles. As a result of this early development, there is a definite and quite simple functional differentiation of sensory cells in the visual center correlated with differences in spatial position of object seen. Certain combinations of visual cell stimuli, acting in conjunction with certain combinations of cell stimuli in other sensory centers, form functional units bringing about a response of definitely adjusted eye and head, and later, arm and hand movements.

Now this differentiation of visual cells corresponding to spatial localization is quite independent of any differentiation depending on difference in sense quality. Color-tone and brightness play no part in the development of spatial coordinations. Compared with the direct and simple functional differentiation of cells due to spatial differences, it might be said that there is no functional differentiation corresponding to differences in sense quality. And yet this would not be true, for the processes which bring about at once the development of behavior and the development of nervous functioning, issue as well in a very characteristic functional differentiation of sense-qualities. Although the cortical cells mediating red and green function indifferently in determining motor adjustments to spatial differences, and belong indifferently to the same functional systems in so far, yet they do not by any means always function indifferently, nor belong to all the same functional systems. On the contrary, they come to be members of a multitude of different functional systems, as it were by sheer chance. The color of a baby's ball may be red, and the paper on the walls of his nursery green; the flowers which he holds and smells are red, and the grass green; and so on indefinitely. That the thousand and one objects of daily life are colored as they are is a fact of little or no significance. The important classes into which the objects of a child's world fall (or our own, for that

matter) are not characterized by colors. The "red" cells (or, if you will, the chemical process in the cortical cells which mediate red) *may* enter into almost any of the minor functional systems generated by the habitual surroundings of a child's daily life. The important point is that, as a matter of fact, they do come to enter into indefinitely different functional relations, just as do the "green," and "blue," and "yellow" cells. Each of these groups comes to be a unit in a multitude of functional systems, and a unit in a different multitude from every other. And the same is true in a greater or less degree of the different groups of cerebral cells mediating the sensation-qualities of the other sense departments. This peculiar characteristic which the sensory cells thus acquire I shall term *functional indeterminateness*, or *functional independence*. My hypothesis accordingly is that *the functional indeterminateness or independence of the sensory cells of the cortex is the essential condition of their mediating the experience of sensation qualities*.

This hypothesis, it is to be observed, is not offered as an alternative to the doctrine of specific energy, but as a supplement to it. That the different sense-organs, and the differentiated groups of end-organs belonging to the different senses should possess a selective capacity with reference to different physical stimuli, and that this nervous discrimination should be represented in the sensory cells of the cortex is, of course, a primary condition for the experiencing of distinct sense-qualities. But as it stands, the doctrine of specific energy is, as I have tried to show, hopelessly inadequate. The fact that certain groups of cortical cells are invariably stimulated by specific sorts of physical agencies is insufficient to account for the fact that we experience these agencies as qualitatively distinct. It is equally essential that these different groups of cells thus stimulated should possess characteristic and distinct functional relations. And such relations, as has been shown, they do possess.

The significance of the functional indeterminateness of the sensory cells must now be pointed out. It might perhaps be supposed at first thought that qualitative distinctness would depend on direct and simple functional differentiation. That is, one might suppose that it would be the stimuli which demanded specific and determinate responses which would be experienced as possessing specific qualities; and that two stimuli which evoked specifically different responses would be experienced as differing in qualitative specificity. But a little consideration serves to show that such a supposition would be ill-founded. If two stimuli habitually and therefore directly evoked specifically different responses, they would probably not be experienced at all. It is only the stimulus which is uncertain, and whose response awaits determination, that rises to consciousness. Our

awareness of it, the degree of our attention to it, depends precisely on its *indefiniteness* as a determinant of response. The stimulus whose response is immediate and certain is one to which we have neither need nor power to attend. Attention means the holding of the gates of action in readiness, a checking of the impulse to act, and consequently an increased excitement of the sensory areas involved. But this is precisely the condition under which the distinctive character of the stimulus is experienced, the condition under which quality emerges.

With this in mind, we are now ready to define more nearly the relation of sensation to perception. The complete determinant of response, as has already been pointed out, is in every case the situation as a whole. The situation itself is constituted by two complex groups of factors—on the one hand, the previous “state of mind,” the whole “set” of the cortex; and on the other, the group of stimuli reaching the cortex through various avenues, so far as these are co-ordinated. (If any fail to enter into coordination they are not experienced at all.) Now this second group has a structure of what we may call the second degree of complexity. That is, the factors into which it naturally falls are themselves complex—they are themselves objects of perception, functional units which maintain their integrity from situation to situation. Let us take an illustration. My behavior at breakfast is a response to the whole breakfast-situation. I come downstairs when the bell rings and take my accustomed seat, greeting the other members of the family as they take their accustomed seats. I stir my cup of coffee, putting in two lumps of sugar, and pouring cream from the pitcher at my right, etc. Now I should not give these same responses to any of the factors of this situation on any other occasion than breakfast. If I meet my brother later in the day, I accost him differently. If I enter the dining-room in the middle of the morning, I do not seat myself in the same place, nor, if a cup is on the table, do I go through the same series of acts. Yet these factors—my brother, the chair, the cup, etc., are each and all functional units. My brother is my brother wherever and however I see him, and he is the object of characteristic behavior on my part. And similarly with the chair or the cup. The various combinations of visual and tactual and muscular and temperature stimuli arising from a dining-room chair are so coordinated that they form a functional unit, which, although “structurally” complex, maintains its integrity in all but unusual circumstances. However much I may hesitate and reflect as to how I shall act toward the chair, I rarely consider treating it except as a chair. My hesitation may cause me to observe the crack in its leg, or the hole in its leather seat, and I may avoid using it, and put it aside to send away for repair.

Now, under all these conditions, I probably have at no time been aware of a single one of the numerous sensations, or sense qualities, which the chair-group of stimuli would ordinarily be said to include. When I touch it, I do not feel the slight cold, nor, as I look at it, do I see the changing hues and tints and brightness of its surface. As Professor Pillsbury has said somewhere, "we see in terms of meaning," and these sensation elements have no relevance to the chair or its condition. But let me enter the dining-room engaged in reflection on psychological analysis, and a new and very unusual situation has arisen. The table and chairs and cups are not the factors of this situation, and all my customary modes of response to these coordinated groups of stimuli are inhibited, and the integrity of the common functional units is broken down. As I look at the chair, I no longer see the *chair*, but the variegated patches of color, and as I touch it I feel the pressure and the cold. But this could not happen if the cortical cells stimulated by these diverse end-organs in retina and muscle and skin did not possess functional independence. It is only because each of these groups of cells belongs in a great variety of functional units, *i. e.*, perceptual systems, that its functioning in the chair-percept can be inhibited, and its own individual quality flash out. Thus while under ordinary circumstances a group of sensory cells capable of mediating a specific sensation quality functions only as a factor in some functional unit, it may, because of its very independence, become determinative of response by functioning as a unit itself. This happens in such children's exercises as the sorting of colored worsteds, or similar Montessori games; and it always happens in the psychological laboratory in the numerous experiments where the response of the observer varies with changes in sensation quality.

Perhaps it will serve to make clearer what is meant by functional independence if we contrast the sort of functional differentiation possessed by sensory cells in the cortex connected with contiguous warm and pressure end-organs on the hand, for example, with the differentiation possessed by cortical cells connected with warm end-organs on the two hands, respectively. The former mediate sensations of the *same* "*local sign*," but of *different sensation quality*; the latter mediate sensations of *different* "*local sign*," but of the *same sensation quality*. Now in the former case, the "contiguous" warm and pressure cells in the cortex have the *same direct* functional connections. They both alike and indifferently evoke the same lower-level responses of touching the back of the hand with the other, of looking at it, etc. But their *indirect* functional connections are indefinitely *different*. For more complex behavior than the mere touching and looking at the spot, it makes a great deal of difference

whether the stimulus is felt as warm or merely as a pressure which excites no temperature sensations. If I am alone in my room in the dark, for example, and the back of my hand comes in contact with something *warm*, I may perhaps shriek in terror. It all depends on the situation, of course, but in similar situations warmth and pressure may lead to very different sorts of behavior.

In the second instance, where the cells stimulated are connected with the warm end-organs on the two hands, the case is just reversed. The more *direct*, lower-level connections are *different*, mediating different simple responses, while the more *indirect* and complicated connections are *similar*. Alone in the dark room, the warmth on one hand is just as terrifying as on the other. One serves as well as the other to initiate the behavior appropriate to "something alive in the room." Broadly speaking, other things being equal, difference of sense-quality in the stimuli means a difference in general character of objective conditions, and a corresponding difference in the sort of conduct appropriate; while difference in local sign, other things being equal, means a difference in the relative position of external objects, and a corresponding difference in the specific modification, or detailed adjustment, of the already indirectly determined general response.

According to the hypothesis put forward in these pages, there is no isolable element of "local sign" to be found by introspection, no specific difference in quality between the pressure on one spot and the pressure on another, precisely because their functional differentiation is of this direct sort, and not of that indirect sort which has been designated functional independence. The experienced difference between two differently located pressure spots can be described only in terms of difference of meaning. One might almost say that it is experienced as a simple and immediate difference in meaning! The only thing existential, the only thing one can lay one's finger on when one attends to a pressure sensation, is its *quality*. And this is precisely because the specific determination of response due to its local sign does not fall within the control of attention. You can not imagine a pressure, or a warmth, or a cold, or a pain on or in the tip of your left ear, without an image arising of a movement of the hand to the spot, or, more probably, without actually feeling the slight anticipatory muscular strains; and you are certain to hold your head tense. But you can imagine the quality of warmth or cold, if it be not localized, without feeling an impulse to any response whatever. Or, perhaps a better illustration (since it is difficult to imagine the temperature qualities)—think of a bright spot, or a colored spot, at the extreme left of the field of vision. You have inevitably an image—or the actual beginnings—or an eye-movement in that

direction. But you can vividly imagine a deep sapphire, or a pearl gray, as such, without any such inhibited responses, for, as sense-qualities, they tend to call out none in particular.

In conclusion, there are a number of observations to be made regarding the general significance of the hypothesis presented in the foregoing pages. In the first place, if this hypothesis be well-founded, the psychological doctrine that the sensation is an element or a constituent of perception, at least in any such sense as it is now held, must be given up. So long as the sensory cells are acting as elements in a functional unit—while, that is, their action is so coordinated with the action of other sensory cells as it is in perception, they are not mediating the sense-qualities of which they are capable. For the functioning of the group as a whole, since it is a *functioning*, and not merely a “chemical discharge,” is not in any sense a resultant of the functioning of the separate cells which compose it. The condition under which the constituent cells of the group may mediate their distinctive sense-qualities is the disintegration of the functional group, and the *independent* functioning of the cells in question. Each perception or perceptual act is mediated, however, by the unified functioning of a more or less variable complex group of sensory cells, and is thus correlated with a more or less variable group of sensation qualities. Accordingly, when the perception is lost through a shift of attention, the sensations that flash out will fall within this group. This much may then be said: Given a determinate set of peripheral excitations, there *may* be experienced any of the specific sensation qualities corresponding to the group of sensory cells excited. Whether *any* of this group, or *which* members, if any, are actually experienced, depends on the functional systems thrown into play within the cortex.

In the second place, from the standpoint of this hypothesis, it is possible to reach a new, and I venture to think a more fruitful, conception of the nature of psychological analysis and introspection.

Thirdly, it offers a new approach to the psychological problem of meaning (a problem vital to any general theory of the nature of consciousness) which, I again venture to think, would free it from many of its time-honored difficulties.

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THE TWO POLES OF THE PHILOSOPHICAL SPHERE

IN our attempts to understand the sphere or scope of any science it sometimes is difficult to point out any one distinguishing purpose, or method, or class of objects by which that sphere is delimited. Within the science in question the several studies seem to cohere rather loosely around some center. Thus, in the case of geology, the initial study seems to have been that of the earth's crust, its structure and stratification. From this, as from a center, geologists have made excursions into studies that are preeminently biological, physical, astronomical, or even chemical; nor is it clear that the purpose is always to throw light upon the original line of inquiry.

In the case of anthropology, the study of cultural origins was the beginning, and still is the nucleus of the science; but the anthropometric interest, which grew naturally enough out of the study of racial origins in their relations to culture types, already appears as an interest largely independent of its origin. The coherence here suggests that of an association complex, the cause being in some measure historical rather than logical,—a matter of custom and habit as much as of demonstrative necessity.

This acquired interest, moreover, of the anthropologist in anthropometric studies seems likely to provide that science with a new center, which might well serve as the nucleus of a vast science embracing most or all of what is now pursued under the name of psychology. In history also we may see a shifting of center. The original purpose of the historian was, ostensibly at least, the chronicling of events. But more and more the actual task of the historian is the illumination of present tendencies and present institutions, as will appear if one glances over the courses offered by any large department of history.

In philosophy, also, I wish to show, there have been and are two nuclei, neither of which seems to be distinguished as clearly as is desirable. By attending to this bipolar character of philosophical science I think we may avoid certain confusions and arbitrary positions, and set about the neglected task of defining the relation of one nucleus to the other.

It is usual to name metaphysics, logic (including epistemology), ethics, and esthetics as the great divisions of philosophy. In Plato's "Republic" we find represented each of these divisions. In addition we may note there the appearance of the type of psychology that is concerned with self-realization and the integration of personality—with the problems of happiness in its relation to character.¹ With

¹ The works of Macdougall and Shand, Perry's "Moral Economy," James's "Varieties of Religious Experience," and Hira's "Origins of Art" occupy the field of this type of psychology.

Professor Creighton we may call this teleological psychology. It is related to ethics, and differs from it much as character is related to and yet differs from conduct. It is this teleological psychology which really sets the problem for the first four books of the "Republic." These books are concerned rather with practical wisdom than with knowledge or science, therein, no doubt, correctly representing the interest of Socrates, and of philosophy when the word was coined.

But in the sixth and seventh books we note a quite different center of interest, *viz.*, the inquiry after the nature of knowledge as distinguished from mere opinion. In the allegory of the cave and in the account given of dialectics, we find, as we find in the "Symposium," that the distinguishing nature of knowledge is placed in its unity, in the complete accordance of its parts. The fifth book, which seems to interrupt the argument, in fact serves to assist and, in a measure, to conceal the transition from one center of interest to the other. I shall call the first the eudaimonistic center and the second the dialectical center of philosophy.²

Let us note with some emphasis that this change of theme and of center is accompanied by a profound modification in the use of terms, and perhaps in the outcome of the argument. In the first part, the appetites are what feed and sustain reason, just as the appetite class in the commonwealth are maintainers and foster-fathers of their guardians. Reason, like the rulers of the state, is essentially the servant, though the guide. In the second part of the "Republic," reason has become the supreme aim of life, to be divorced from sense and appetite and use. Whereas in the first part Socrates questions whether the Tolstoian simplicity of villagers, reclining on rude beds of yew and myrtle boughs, is not the course of true health and wisdom, in the second, Plato presents the sage as turning with regret from his blessed speculations to legislate and educate from a sense of compulsion and duty. The "diseased" or "inflamed" commonwealth of the first part has in the second become the eternal civic pattern set in heaven.

We are forced to look upon this dialectical theme and interest as a new and distinct center because, while it also prescribes the organization of the state and the education of its guardians, it is not in its turn derived from the positions adopted in the first part in considering the eudaimonistic problem. Nor can it be said that in the whole history of philosophy there has been any direct and rigorous attempt to justify the dialectical pursuit upon eudaimonistic grounds. As Mr. Russell says, it appeals to but very few men.³

² We may suppose that it was his contest with the Sophists that urged Plato to the extreme dialectical position.

³ "Scientific Method in Philosophy," p. 237.

Dialectics must be looked upon as a distinct center and interest, also, because in its search for a completely unified knowledge it has generally recognized that this ideal can be achieved only through a certain detachment or disinterestedness, a neglect of the individual point of view. But this individual point of view is of course essential to the study of the conditions of happiness. Hence, it would appear if the dialectical center is to be taken as the sole or the essential center of philosophy it must define very clearly the relation of its selfless, disinterested knowledge to the sort of awareness that takes note of relations to the self and to individuals. But it seems, on the contrary, that the more precisely the dialectical purpose is conceived and pursued, the less is this relationship made manifest and clear.⁴

To illustrate this point I would refer to Mr. Russell's "Scientific Method of Philosophy," where in the following terms the dialectical ambition is stated with unsurpassed clearness:

The body of common knowledge is our data; by analysis we reduce these data to propositions that are as nearly as possible simple and precise, and, arranging them in deductive chains, we arrive at certain initial propositions which serve as a logical guarantee for all the rest. These then appear as premises from which may be deduced the body of common knowledge from which we started.⁵ Were Plato living now, in what words could he better describe his dialectical aspirations?

It is to this dialectical ideal of complete knowledge that Russell appeals in debating the freedom of the will.⁶ Since such knowledge would embrace the future as well as the past, he argues, to it future events are just as determined as the past, and the apparent indeterminateness of the future is therefore a result of our ignorance. "It is a mere accident that we have no memory of the future." But, let us note, in experience that is *not* selfless, knowledge consists largely in appreciating the difference between events of which we have memory and events of which we have no memory; and with the absence of memory appears indeterminateness. Hence, to ignore indeterminateness would for this type of knowledge be ignorance indeed.

The question then hinges on the relation between the ideal of complete knowledge and that sort of knowledge which in its nature can not be complete. For it is clear we can not combine in one awareness

⁴ Compare Spinoza's vague assertion that modes are in God, or Kant's arbitrary isolation of duty and the rational from desires and the sensible. May "disinterested love of knowledge" be reduced to the instinct of curiosity, turned, through the infant's inactivity, from sensations to images, and to self-assertion purified from pugnacity by fear, reenforced by play tendencies?

⁵ *Op. cit.*, p. 211.

⁶ *Op. cit.*, p. 234.

the sense that an event has not yet occurred with the sense that it has occurred. Yet both awarenesses are very important pieces of knowledge in every-day experience. Now the relation between knowledge that can not be completely unified, and the dialectical ideal of completely unified knowledge is considered by Russell only in such terms as these: "The free intellect will see as God might see, without a *here* and *now*, without hopes and fears, in the sole and exclusive desire of knowledge."⁷ This statement seems to establish the manifold ignorance of such a God, and the incompleteness of such knowledge. It leaves quite undefined the relation between the dialectical postulate and such knowledge, if it is to be allowed the name, as the practical man deems most important.

Mr. Russell identifies this dialectical procedure with the study of logic,⁸ which thus becomes the "central study of philosophy," and "gives the method of research in philosophy," just as mathematics gives the method in physics. Of such a philosophy he says⁹ that it must not hope to find an answer to the practical problems of life. All the supposed knowledge in the traditional systems (of philosophy) must be swept away, and a new beginning made.¹⁰ However, of the prospect of progress in philosophy it would be rash to speak with confidence.¹¹

But, until this absorption in the dialectical pursuit is justified in its relation to the eudaimonistic interests of philosophy, must it not be classed, whether in Plato or in Russell, as a sort of obsession, a dogma, a religion? We may note its outcome in stimulating science, or in encouraging religious organization along the lines of a fixed and absolute creed, or in supporting an intolerance of conscience which is assumed to correspond to some eternal order of right and wrong. We may note its emergence in the Heracleitean conception of a *logos*, one and everlasting, and its persistence in setting the rational over against the instinctive, and the spiritual in contrast to the natural. But meanwhile there seems no adequate ground for identifying its pursuit with the scope of philosophy.

The picture I would now fix in mind, therefore, of the structure of philosophical science, is that of a sphere, with dialectics, the study of the presuppositions of a completely unified knowledge, at the North Pole, and at the South that study of the concrete individual, of psychical integration, of character and happiness which has been termed teleological psychology. (If we give to metaphysics the equatorial region, the intermediate zones may readily be assigned.)

⁷ "Problems of Philosophy," p. 248.

⁸ "Scientific Method," p. 239.

⁹ *Op. cit.*, p. 29.

¹⁰ *Op. cit.*, p. 240.

¹¹ *Op. cit.*, p. 242.

The purpose of this picture, and of this paper, is, in the first place, to show the isolated position at present occupied by the dialectical postulate of a completely unified knowledge, laying upon its supporters the burden of showing why logic and metaphysics and ethics need attach to this concept great importance. In the second place, the type of psychology which may be termed teleological, so little developed by professional psychologists, I would suggest is in truth an essential and a distinct branch of philosophical science, and perhaps its true center and nucleus.

This position will be received, I suppose, with more tolerance, if we recognize that the structure of any science may be somewhat loose, and hard to define in terms of any single purpose or method, that it may in fact be an accretion around more than one center of interest, as in the illustrations at the commencement of the paper.

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THE USE OF THE WORDS REAL AND UNREAL

THE papers of Professor Sheldon and Dr. Owen on "Unreality,"¹ call for further consideration on the part of those who are anxious that clear and definite ideas shall replace the merely emotional afflatus or vague edification that generally attaches to the words reality, experience, and the like.

I

Professor Sheldon's paper leads to a result to which I heartily subscribe, *viz.*, that the term *unreality* has been "a dead weight upon the mind—delivering no information and explaining nothing." But the dialectic method by which he seeks to establish this result seems to me entirely inconclusive.

The essence of Professor Sheldon's method consists in defining reality as bare being (including the King of Utopia, wooden iron, and Heaven knows how much else), and then ruling out of court all conceptions of reality not consistent with this certainly unusual definition. It is, of course, quite clear that if *reality* is identical with bare *being*, and the latter includes all that is mentionable and unmentionable, then there can be no *unreal* objects. But it is also clear that in all the great philosophic adventures reality has never been conceived as bare being, but rather as a certain kind of being, quite distinct from other kinds of being that must thus be defined as unreal. Unreality is thus as necessary for the significant existence of reality, as pupils are necessary for the existence of a teacher, or sub-

¹ This JOURNAL, Vol. XIII, pp. 318, 322.

jects for the existence of a sovereign. Professor Sheldon assumes that if reality is held to be a specific kind of being, it must necessarily be defined as *being plus a given quality*. I am not sure that this is necessarily so. Conceivably one might begin with a list of categories or types of being, and define qualities by reference to these classes. But even if we waive this point we need not admit that Professor Sheldon has made any valid objection to defining reality as being plus a given quality. He urges that no quality can be more real than another, and therefore, all definitions of reality are arbitrary. But Professor Sheldon's assumption that all qualities are equally real follows only from his peculiar definition of reality. To one, for instance, who defines reality as being that has consistency, position in time and space, or is the fulfilment of a purpose, the quality of not having this attribute certainly does not belong to the realm of the real.

Professor Sheldon says: "There is an absurdity lurking in any definition of reality . . . the minute we make predications we leave the sphere of Being [why on earth the capital?] and go over to that of character." But this argument is again the assumption that reality can be nothing but characterless being which is thus indistinguishable from nothing. There is a certain arbitrary element in all definitions, and Professor Sheldon has a perfect right to define reality in the peculiar way he does, so that having no negative it becomes insignificant; but this offers no basis for attacking the equal right of others to define reality in a different way, provided they hold to it consistently. As a matter of fact, Professor Sheldon does not succeed in holding to *his* definition consistently when he speaks of reality as something positive and present to the mind, or has the fullness of being, or is synonymous with actuality. Surely many things, like the end of the present war, have being, but are devoid of actuality.

Not only has Professor Sheldon failed to show that the term *unreality*, as used in any actual or historical philosophic venture, involves self-contradiction, but it may be maintained that no term as such involves self-contradiction. It is only the definition of a term that can come into contradiction with some other definition or proposition in the same system.

II

Dr. Owen's method is more empirical or historical. *Real* and *unreal* are terms which have been used by people to distinguish certain things, and the task of the philosopher is to find out what precisely people have in mind when they use that distinction. This makes the task of the philosopher the same as that of the lexicographer; and doubtless it is of the utmost importance to make explicit

and clear that which in ordinary usage is implicit and unclear. But that is, I imagine, only the beginning of philosophic wisdom. Experience shows that words that are widely used acquire a great variety of meaning, and frequently there is nothing but a merely historical or accidental connection, if any, between the different meanings of the same word in actual usage. If we examine the meanings of the word *cause*, *right*, or of the little word *or*, we find that each has a variety of meanings which have nothing philosophically significant in common. In the light of linguistic experience I think that Dr. Owen's initial postulate, that if "words are habitually used" they "must have a definite connotation,"² not only fails to possess logical necessity, but does not even possess a high degree of probability. At any rate, one has no right to start with the question, what is *the* philosophic meaning of a word like *reality* (except in a given context). One must, to make Dr. Owen's procedure defensible, first undertake an exhaustive catalogue and analysis of *all* the meanings of the term and show affirmatively that all these meanings *do* have something in common. I doubt, however, whether that procedure would yield much that is significant.

Dr. Owen's analysis of the examples he has chosen serves to show that people use the terms real and unreal to denote the distinction between that which has the value of genuineness and that which is spurious, *e. g.*, real money as opposed to counterfeit, real diamonds as opposed to glass or paste, etc.³ But *reality* has also been widely used in many other senses. Thus it is used to denote a certain vividness or intensity of feeling, as when we say, the sufferings of Jean Valjean or Monte Cristo are more real to us than those of actual Chinamen personally unknown to us; or when we say that the imaginary heroes of our childhood were more real to us than our unknown ancestors. The *real* is also that which stands in a certain relation of priority or superiority to the *seeming*. The two railway tracks may *seem* to meet, but we know they are *really* parallel, *i. e.*, the latter judgment harmonizes better with all other judgment and explains even how the seeming arises. Again, when we speak of the *real* Mr. X, behind the outer manner, and in general when we contrast reality and outer appearance, we have with us the ancient idea of essence, as opposed to extraneous or removable circumstances, the kernel of the cosmic nut.

² This postulate is also used by Professor Sheldon in his papers on Causality.

³ Though Dr. Owen disclaims it, I fail to see how his analysis does anything more than show that by real and unreal we mean the objects of true and false judgment, respectively. This is perhaps obscured by the figurative language such as "the stones masquerade as diamonds." Does this mean anything more than that we judge them to be diamonds? And when it is said further that they "are unable to substantiate their pretensions" does this mean anything more than that we have found our original judgment to be false?

If we canvass the technical philosophic definitions of reality we find them almost as numerous as philosophic systems. The materialist and the Hindoo mystic may both use the word *reality* and they may both experience some elation or feeling of superiority when they utter it, but they mean by it entirely different things. We may for mnemonic convenience sum up the difference between these two philosophies by saying that they define reality in different ways. But two systems that differ only in a definition may be theoretically equivalent, *i. e.*, they may differ only in the names they attach to the same entities. If there is a genuine difference between materialism and mysticism it is because they differ as to whether certain entities possess given characteristics or whether certain inferences are valid. But there can be no doubt that their use of the same word *reality*, especially when their definitions are not explicitly stated at the outset—tends to hide and confuse the important significant differences.

III

The question as to the use of the terms real and unreal seems to me primarily a practical one, *i. e.*, a question of linguistic policy. I take it that no one would deny that the great need of philosophic discussion is for terms that have a definite connotation rather than an honorific use. Do the words *real* and *unreal* in actual usage always denote some definite object or aspect of things? Can they not be replaced by some neutral words or symbols that do not drag with them penumbra of shadowy meanings and emotional associations that hamper the spirit of inquiry? You may define the term *real* in any way you please, but experience has shown that the chances of your always communicating some definite idea by its use are very meager. *Reality*, let us admit, has become a term of popular philosophic cant taking the place that words like *nice* or *grand* have among the less cultivated members of the community. Why can't we agree to eliminate these banal words altogether? It is difficult, I admit, for any one of us to get rid of the habit of using such convenient satisfying words, but it seems to me that a consensus of the philosophically educated might at least make the use of these terms a sign of bad taste, and thus lead to their gradual elimination. In all the advanced special sciences the discarding of vague popular terms and the substitution for them of purely technical terms or symbols have been of inestimable value in the elimination of misunderstanding and indefiniteness of fundamental issues. I think the same would be true of philosophy if we could agree to give up such edifying but confusing words as reality and experience.

MORRIS R. COHEN

COLLEGE OF THE CITY OF NEW YORK

REVIEWS AND ABSTRACTS OF LITERATURE

The Crowd in Peace and War. MARTIN CONWAY. New York: Longmans, Green, and Company. 1915. Pp. 332.

How profoundly the great war is affecting the minds of all thoughtful men is indicated in the fact that the author of this work, who is professor of art in Liverpool and Cambridge, and who has already published nine books concerning matters artistic and ten relating to exploration and the sport of mountain-climbing, turns here to a special inquiry in the field of psychology as this is related to war.

As our author's mode of approach is in the main quite original, and as he makes few references to other writers on similar subjects, his book may be considered solely on its own merits. Treated as such, the reader can not but find it intensely interesting (there is not a dull page from cover to cover) and at the same time will find himself stimulated by much enlightening discussion and keen analysis.

Sir Martin begins with a study of the nature of crowds and of crowd leaders; he then treats of crowd organization and of the relation of the crowd to government; then of the relation of the crowd to liberty and freedom, to education, to morals and religion; then of "over-crowds"; and finally gives five short chapters, less than a fifth of the volume, to the application of his thought to war.

The crowd, as he uses the word, is any form of expression of man's gregarious instinct; we have examples in mobs, and "well-behaved crowds," races, empires, nations, ecclesiastical and religious bodies, political parties, in fact any group that possesses a separate existence and an internal unity whether this does or does not involve physical presence together at one time or place (p. 15). The minimum number of a crowd he thinks is determined by the fact that "its numbers are too large for general conversation to be possible. . . . Experience proves that a jury of twelve does in fact act as a crowd, and it is probable that that number has been in process of time arrived at because it is the minimum number that can be normally relied upon so to act" (p. 22).

Taken in this broad sense, he attributes to crowds certain characteristics which may well form the basis of our main consideration in this brief review. The mark of the crowd as distinguished from the individual, he tells us, is that "individuals and crowds act on different motives, individuals being directed in the main by reason, crowds by emotion" (p. 21). The crowd does not possess "the power of restraint and direction provided for individual wisdom, experience, and foresight. . . . It merely desires" (p. 153). "No two individuals (p. 32) can ever think alike, whilst any number can feel alike" (?). "Absorption into a crowd is not an intellectual but an emotional process" (p. 40).

In all this there is much of truth, but in it all is a minimum of error which is very significant in its results; for we here see emphasized the commonplace misconception that individual men are "directed in the main by reason," to which no psychologist to-day will agree. Nor is the

sharp distinction between the individual and the crowd made on this basis fundamentally true, if we consider the crowd, as we should, merely as a grouping of individuals. If we do so we should properly express the facts which Sir Martin so forcibly presents by saying that individuals when correlated in crowds find themselves more than usually carried away by instinctive reactions, of which emotional expressions are a special type; this being largely due to the fact that where crowds exist waves of emotion are cumulatively stimulative, and thus the directing power of the individual which is involved with intelligence is inhibited.

The commonplace error thus referred to might be excused in a work which appeals, as this does, to a more or less popular audience, did it not carry with it a constant tendency to treat the crowd as a *quasi* personal entity. Thus the crowd is spoken of as a "beast" (p. 234) and we are told that "all nations are natural born fools" (p. 98). Thus, again, our author speaks of crowds as possessing two instincts; "the instincts of expansion and of self-preservation" (p. 70), forgetful that these passions exist in the individual members of the crowd and not in the crowd as distinguished from the individual. And again we read (p. 298) that "crowds display every degree of self-consciousness."

All this might be passed over without serious criticism were it not that this view, as here and elsewhere expressed, carries with it the vicious notion that in becoming a member of a crowd the individual's independent existence practically disappears, and with it his moral obligation and responsibility, a notion which may be repudiated when clearly stated, but which must necessarily affect the thought of those who, even tacitly, accept this conception of the personal nature of a crowd.

The acceptance of this conception also leads one to overlook the fact that the instinctive action of the crowd is the sum of the instinctive actions of the individuals forming the crowd (*cf.* p. 270 "The power that makes war, and wins victories, is the passion of a people"); and that the control of the crowd instincts, such, for instance, as are involved in the initiation and prosecution of wars, can only be gained by efforts to control the instinctive responses of the individual. We shall never get rid of war until we learn to curb the fighting instinct of individual men, which in its collective aspect is war; or to remove the stimuli which lead to the automatic expression of this instinct, *e. g.*, in hate and covetousness, which in their collective forms appear as international suspicion and hate, and as that international covetousness which leads the most advanced of nations to exploit the so-called "lower races."

In fact, Sir Martin tacitly accepts this view that we must deal with crowd reactions as the reactions of the individuals composing the crowd, notwithstanding the fact that his view above referred to stands in opposition. For he treats of war as the expression of instinctive phenomena, which, of course, can only appear as the acts of individuals. Thus he holds (pp. 266 ff.) that all independent nations, as such, "are mutually hostile to one another," this hostility being merely latent "in times called times of peace"; in this maintaining, somewhat after the manner of

Kant, that "a state of war is the natural condition of independent crowds, and would be their normal state but for the impediments placed in their way." "It is not the cause of war," he says, "that requires to be sought, but the cause of peace" (p. 268).

Following this train of thought he argues "it is ultimately only force that preserves peace between similar crowds, and that kind of force can not be provided except by an over-crowd" (p. 272), the formation of which "is the only force by which war can be banished" (pp. 276-7). In this he is apparently not only upholding the formation of an international "League to Enforce Peace," but is also assuming that international armies and navies will be the only weapons such a League can wield. To this last point not all who wish for the establishment of such a League will agree; for it may well be that a new weapon, equally effective and less cruel than war, will be found in thoroughgoing international ostracism.

Enough has been said to indicate the interest of the book; this review would be inadequate, however, did it not refer to the wealth of illustration from current affairs, and the brilliant and often witty suggestions found from time to time in its pages; as, for instance, where our author suggests (p. 148) that, as kings are needed, we call in "the aid of science to direct the breeding of a truly royal race"; and where he argues (p. 116) that "if sin be defined as an action done by an individual to the detriment of the crowd to which he belongs, and the latest category of sins is certainly of that sort, it follows that an individual [who is a crowd-representative], who in fact incorporates his crowd and can not act but in conformity with it, can not sin. A king, therefore, can do no wrong when he is acting publicly as king; whilst constitutional securities prevent him from publicly acting in any other way. Thus, too, the Pope is of necessity infallible, from the point of view of his crowd, when he speaks *ex cathedra* and *de fide*, that is to say, under the restrictive control of all those securities which in fact provide that he shall voice the sentiments of the crowd which he officially incorporates."

HENRY RUTGERS MARSHALL

NEW YORK CITY

Trends of Thought and Christian Truth. JOHN A. W. HAAS. Boston: Richard G. Badger. 1915. Pp. 314.

The point of view of this fresh metaphysical orientation is suggested by the title: the Christian fundamentals are "truth"; the doctrines of present-day philosophy are "trends of thought." The discussions are calm and fair, and show a wide range of reading; but they do not undertake to establish the Christian position. That is taken for granted. The book is not properly an apologetic, being written, not for the independent inquirer, but for the orthodox believer who wishes to know how the newer philosophical thought of the day bears upon his faith. To others the interest of the book is likely to be largely in the frank way in which it recognizes the importance of "modern logical positions"—a field so scandalously neglected by some metaphysicians.

In pursuance of his aim the author reviews in succession the claims of mathematics, induction, hypothesis and trial, mechanics, biology, psychology and sociology to furnish the norms of truth, and evaluates each of them on the basis of the needs of Christian belief and life. The prestige of mathematics, based upon its accuracy and great constructive range, he finds to be greatly abated by recent criticism, which shows that it is based more upon postulates of reason than upon existential facts. Hence "mathematics can not claim to dictate to religious experience or thinking." Induction he reduces to the "arrangement of phenomena according to a constant." The ordinary use of it he considers to be unduly narrow, in that it assumes that the "constant" must be quantitative, *i. e.*, in the material order, whereas the constants of Christianity, which have a place for induction, are the religious consciousness (internal) and a real revelation (external). In this field the author encounters narrow sailing when he attempts to justify the use of analogy to establish cosmic design and yet exclude it from the interpretation of Christianity as compared with other religions. Hypothesis "has and can lead Christian thinking to new possibilities and fresh vistas," but the author thinks the "conjectural imagination" has been abused (through "a wrong naturalistic presupposition") in the historical criticism of the Bible. The value of the concept of mechanism is recognized within limits. The objection is raised, however, that it is fundamentally static, whereas Christianity is progressive. The value of the evolutionary idea is recognized, also, but the determinism based upon the sole sway of environment, heredity, and variation is rejected. "There can be no toleration on the part of Christianity," says President Haas, "of any evolution which is its own beginning and continuation, and of any creation which has its origin in a process, but not in God" (pp. 121 ff). As to the psychological investigation of religion, though it arouses his interest and sympathy, yet he denies that judgments based upon it can be final; for, if so, religious ideas and ideals would have no independent worth, and there would be "no freedom for faith."

The second part of the volume contains careful reviews of absolutism, mysticism, pragmatism, neo-vitalism, and neo-realism, in all of which more or less good is found, but none of which is wholly approved. Eucken's system is the one most acceptable. As to absolutism, Dr. Haas's judgment is that "we are safe only when we maintain a transcendent God . . . immanent by presence and effects, but not in essence and being." Pragmatism is approved in so far as it stands for development, for hypothesis and trial in experience, and for emphasis upon values and freedom; but it is condemned for its common allegiance with pluralism and naturalism, its disparagement of sovereign ideas, and its undermining of religious authority.

WILLIAM FORBES COOLEY

COLUMBIA UNIVERSITY.

JOURNALS AND NEW BOOKS

RIVISTA DI FILOSOFIA. May, 1916. *Antistene* (pp. 157-171): G. ZUCCANTE. - Antisthenes, a pupil and friend of Socrates, rejected the theoretical teachings of his master, and, by so doing, was led to the negation of science and knowledge. *Autorità e libertà in filosofia* (pp. 172-190): M. LOSACCO. - The true value of a philosophical system is not measured by the number of disciples it may gain, but by the further thought which springs from it. *Guerra e diritto* (pp. 191-216): G. FOLCHIERI. - War is a true reality and a manifestation of reality which has its roots in that same human nature of which the whole history of our race is a product. *Il pensiero storico italiano nel Settecento* (pp. 217-249): G. NATALI. - A synopsis of the philosophy of Italy during the eighteenth century. *Scuola e Pensiero italiano* (pp. 250-274): T. ARMANI. - The function of the school is to understand and to teach the causes of our national development, without which our present ideas lose their historical continuity and their philosophical significance. Aldo Mieli, *Le scuole ionica pythagorica ed eleata*: A. FAGGI. E. de Michelis, *Il problema delle scienze storiche*: A. ALIOTTA. Henri Marconi, *Histoire de l'involution naturelle*: R. FUSARI. L. Carabellese, *La scienza morale*: G. VIDARI. Visconti Luigi, *La Pedagogia del romanticismo tedesco*. G. VIDARI. *Notizie e Commenti. Sommarii di Riviste.*

Merrington, Ernest Northcroft. *The Problem of Personality*. New York: The Macmillan Company. 1916. Pp. viii + 229. \$1.30.

Pillsbury, W. B. *The Fundamentals of Psychology*. New York: The Macmillan Company. 1916. Pp. vii + 562. \$2.00.

Ritchie, David G. *Natural Rights*. London: George Allen and Unwin; New York: The Macmillan Company. 1916. Pp. 304. \$2.60.

Webb, Clement C. J. *Group Theories of Religion and the Religion of the Individual*. London: George Allen and Unwin; New York: The Macmillan Company. 1916. Pp. 208. \$1.75.

NOTES AND NEWS

Nature comments as follows on the death of Mr. Benjamin Kidd: "Mr. Benjamin Kidd, the author of important books and articles in which a system of social philosophy is developed from an original point of view, died on October 2, at fifty-eight years of age. His first work, 'Social Evolution,' is the best known, and when it was published in 1894 its originality and force were recognized immediately. The keynote of the work was the declaration that religion is not the enemy of science and enlightenment, but, on the contrary, through the ethical principles of its teaching, has been one of the most important agencies in social development, and is closely bound up with that portion of our nature to which all modern social advance is due, and by which the course of future progress will be decided. Mr. Kidd thus found the causes of the evolution of society and of modern

civilization, not in the growth of intellect and of science, but in the continuous action of religious beliefs. In 1898 was published his book, 'The Control of the Tropics,' which directed attention to the importance of the tropics in the development of civilization; and in 1902 appeared his 'Principles of Western Civilization,' which made 'efficiency in the future' the determining quality of social development. This 'projected efficiency,' when 'society, with all its interests in the present, is subordinated to its own future,' was regarded as the secret of success and of progress, and its absence was the cause of stagnation. Mr. Kidd was also the author of other notable works. To the tenth edition of the 'Encyclopædia Britannica' he contributed a prefatory article on 'The Application of the Doctrine of Evolution to Sociological Theory,' and for the eleventh edition he wrote the article on sociology. In 1908 he delivered the Herbert Spencer lecture at Oxford upon the subject of 'Individualism and After.'"

DR. WILLIAM FREDERICK BOOK, formerly professor of educational psychology at Indiana University, who for the past three years has been on leave of absence from the university, and employed by the Indiana State Board of Education to organize vocational education in the state under the new Indiana Vocational Education Law, will return to the university next fall, as soon as the state vocational surveys now being made under Dr. Book's direction are finished and recommendations made for further developing vocational instruction in the state. At a recent meeting of the Board of Trustees, Dr. Book was appointed director of the psychological laboratory, in the department of sociology, the position formerly held by Professor M. E. Haggerty, and professor of educational psychology in the School of Education.

THE twenty-fifth annual meeting of the American Psychological Association, in affiliation with the American Association for the Advancement of Science, will occur on Wednesday to Saturday, December 27 to 30, in New York City. By invitation of the psychologists of Columbia University the sessions will be held at that institution. It is proposed to hold the regular meetings in Teachers College. Since this meeting marks the twenty-fifth anniversary of the association, an appropriate programme commemorating the event will be held on Thursday afternoon, December 28, the annual banquet being held on the evening of the same day.

MR. W. S. MILLER, who was assistant in education, and secretary of the School of Education, University of Illinois, from 1912 to 1916, has been appointed to an assistant professorship in education at the University of Minnesota. He will have charge of the practise school connected with the College of Education.

DR. ELIZABETH WOODS some time ago resigned her position as assistant professor of psychology at Vassar College to become director of Child Welfare in Pasadena, California.

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

LANGUAGE AND THE ASSOCIATIVE REFLEX

STUDENTS of epistemology have curiously neglected the study of language as the medium in which our more significant knowledge is retained and rendered effective. Recent developments in psychology, however, have rendered a restatement of the problem imperative. In particular, the problems treated by Mr. F. L. Wells¹ furnish suggestions that no philosopher can longer afford to neglect. If we take the fact that "a response primarily elicited by one class of objects becomes elicited by another class of objects associated with the first"² and combine it with the fact of "affective transference, by which the affect, originally attaching to some special experience, is loaded upon another perception or idea somehow associated with that original experience"³ we surely have a basis upon which the fundamental facts of the use of language can be understood.

To take an obvious example, I associate certain inflections of the voice with certain emotional states, and the word "fire" with a certain experienced fact, then, upon hearing someone shout "fire!" I respond to the object and the emotional states of him who called. That is, a second class of objects, the words uttered and the inflections in which they are uttered, invoke a response from me that would normally be invoked by objects themselves. The thesis of this paper is, then, that words, spoken or written, are objects that have become so thoroughly associated with other objects or situations that, in the absence of them, they can evoke responses, both emotional and practical, which would be evoked by the things themselves. But since the example chosen may seem to be misleading, as specially selected for the case in question, and the thesis not applicable to articles, prepositions, conjunctions, and the elaborate technicalities of developed speech, it is necessary to work it out more fully in terms of the growth of language, and this shall be the task of this paper. Fortunately Professor Jespersen, in his noteworthy book, "Prog-

¹ This JOURNAL, Vol. XIII, pp. 354-6.

² *Loc. cit.*, p. 354.

³ *Loc. cit.*, p. 355.

ress in Language,"⁴ has furnished the material adequate to our purpose.⁵

To seek the absolute beginnings of language is, of course, an impossible task, for in evolutionary history it is certainly not true that men arose and then learned to talk, but rather, in the course of development, animal noises became gradually transformed into articulate speech. And the language learning of children is not an adequate starting point, for in the child we have a being with maturing speech organs copying the behavior of those about him who already talk, while for primitive man, the acquisition of speech was a genuinely creative task. The speech of savages is, however, more illuminating, for it represents arrested, or at least retarded, development along lines that are probably not wholly without analogy to those along which more successful speech has passed.

Professor Jespersen's method is "to trace our modern nineteenth-century languages as far back in time as history and our materials will allow us; and then, from this comparison of present English with Old English or Anglo-Saxon, of Danish with Old Norse, and of both with 'Common Germanic,' of French and Italian with Latin, of modern Persian with Zend, of modern Indian dialects with Sanskrit, etc., to deduce definite laws for the development of languages in general, and to try and find a system of lines which can be lengthened backwards beyond the reach of history." It is interesting to note that the results of this method have been greatly strengthened by the recent work of anthropologists.⁶

The result⁷ can be summarized as follows: (1) "We observe everywhere the tendency to make pronunciation more easy, so as to lessen the muscular effort; difficult combinations of sounds are discarded, those only being retained which are pronounced with ease." (2) "Ancient languages have several forms where modern languages content themselves with fewer; forms originally kept distinct are in course of time confused, either through a phonetic obliteration of differences in the endings, or through analogical extension of the functional sphere of one form." (3) "While our words are better adapted to express abstract things and to render concrete things with definite precision, they are comparatively colorless. The old words, on the contrary, spoke more immediately to the senses, they were manifestly more suggestive, more graphic and pictorial; while to express one single thing we are not unfrequently obliged to piece the image together bit by bit, the old concrete words would at once

⁴ Macmillan, 1894.

⁵ Cf. Esp. Chs. V., IX.

⁶ Cf. Marrett, "Anthropology," Ch. on "Language."

⁷ Jespersen, *loc. cit.*, pp. 339-365.

present it to the hearer's mind as an indissoluble whole." In other words "*the evolution of language shows a progressive tendency from inseparable irregular conglomerations to freely and regularly combinable short elements*" (p. 127).

So much for the facts. Our next problem is their interpretation. To begin with the concrete character of the vocabulary. If "the aborigines of Tasmania have a word for each variety of gum-tree, wattle-tree, etc., but no word for tree"; if "the Mohicans have words for cutting various objects, but none to convey *cutting* simply; and the Society Islanders can talk of a dog's tail, a sheep's tail, or a man's tail (?), but not of *tail* itself"; if "in Cherokee, instead of one word for 'washing' we find different words, according to what is washed,"⁸ the suggestion is too strong to neglect that the word is originally a more or less complex sound that has become associated with certain things or situations and become a substitute for them in evoking responses. Hence the sound has taken upon itself the character of the word. It has become relatively the same thing to hear the word that it was to look on at the situation, or in some cases, to take part in it. We have in them cases of associative reflexes.

The fact of simplification of grammar is equally striking. Thus if words are not built up from roots, but roots "are abstractions of that which is common to a group of words which are *felt* as etymologically related," as Professor Jespersen believes (p. 114), as *sorrow* and *sorry* are felt to be related to one another although 1,000 years ago one belonged to the Old English *sorg*, "care," and the other to *sarig*, "wounded,"⁹ grammatical structures must somehow have resulted from abstractive comparison of sentence words and served to reduce the tremendous vocabulary that so many independent terms would have compelled. In other words, we have a case of a simplification in the second class of objects which have become associated with the first and act as substitutes for them in evoking reactions. But there is also another consequence of this fact that we must not pass over.

Professor James, in his "Psychology," speaks of feelings accompanying the various prepositional parts of speech, such as a feeling of "of," a feeling of "by" and a feeling of "for," and many have found these feelings of an intangible character that is difficult to articulate. If the above suggestions as to the psychological origin of language is correct, however, this obscurity could be explained on the ground that *it is always a sentence and never a detached word that has psychological significance*.¹⁰ The writer has always found

⁸ Jespersen, *loc. cit.*, pp. 350-1; Marrett, *loc. cit.*, gives many other examples.

⁹ *Loc. cit.*, p. 115.

¹⁰ "It seems fairly evident that the selection of such simple terms must

that when the above prepositions are mentioned, he invariably completes them either by a number of particular instances in each case or by the indefinite form, "of," "by" or "for something." He doubts even if nouns themselves have independent significance; "tree" means "look at the tree"; "ocean," "swim in the ocean" or something of the sort.

Finally, the phonetic simplification is nothing but a special case of the simplification in movement as any acquired mode of action becomes habit.¹¹ Why particular sounds came to represent the situations they do, is, for the most part, beyond the scope of our knowledge, although there is doubtless some truth in the "bow-wow" and "pooh-pooh," if not in the "ding-dong," theories of the origin of speech. Sounds made on the inspired, instead of the expired breath which still exist in some savage communities, and the pitch accent, which was characteristic of ancient Greek, are sufficiently difficult to account for their disappearance, and the speech of the uncultivated illustrates a further simplification in our day.

And this suggests one further thought. Without involving the controversy concerning "imageless thought," one can recognize that the larger part of thinking takes place in the form of the repetition of sentences. In this repetition, however, a further simplification has taken place, for the sentence no longer has to be uttered, and when the procedure is rapid, the words are not even fully articulated. But is not this a continuation of the same process, and may it not be that the physiological procedure of thinking is nothing but a simplified process of articulating words or sentences and responding to them by articulating more words or sentences until finally those occur which represent, in the associative reflex, a situation demanding some other sort of response such as an overt action? Knowledge would then be nothing but a preparation of reflex connections between this secondary class of objective responses such that, given a certain situation, the right reflexes would take place to precipitate suitable action as their final outcome when the "train of thought" preceding the action had been brought to an end.¹²

Such a state of things, of course, supports the instrumental theory of knowledge, and for this sort of thinking, at least, the problem of images disappears and the question of the resemblance of images to their objects is almost meaningless, for the image is to a certain extent depend upon the chief interests of a people; and where it is necessary to distinguish a certain phenomenon in many aspects, which in the life of the people play each an entirely independent rôle, many independent words may develop, while in other cases modifications of a single term may suffice."

¹¹ Boas, "Handbook of American Indian Languages," p. 26.)

¹² Boas, *loc. cit.*, p. 28.

¹³ Cf. Watson, "Behavior," Section on Language.

merely the word, and words stand for objects, not from any resemblance, but because they have become established as objects which not only take their place in eliciting practical responses, but also because on them are "loaded" all of the affective states which originally were awakened by the situation in question. They are genuine cases of the union of "*Übertragung*" and the conditioned reflex.

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A FURTHER WORD ON BLACK

PROFESSOR WARD is naturally disappointed that his arguments against the sensory character of black failed, for some ten years, to call forth a reply. He is disappointed that the reply, when it appears, comes at second hand; his present paper¹ is nominally concerned with myself, but his thought is still with Hering. He is further disappointed that my reply deals with only a part of his discussion, and that I rest my case rather upon psychological observation than upon psychophysical theory. I wish that I could relieve this disappointment; I wish very much that Hering or Stumpf or G. E. Müller would comment on Ward's objections. Meantime I can not, for reasons already given, enter more extensively into the questions he has raised. They are, so far as I can see,—and I hope that the difference of opinion may be thus expressed without discourtesy,—irrelevant to the main issue: is black a sensation? All that I now attempt, therefore, is to meet the points that Ward makes in direct rejoinder to my criticism.

1. Black, Ward says, can not be a sensation because "experience can not begin with negation and vision can not begin with black"; "my point, in short, is the obvious one that the experience of darkness presupposes the experience of light and answers to its absence." The "negation," as I need hardly repeat, is the very thing to be proved; and so long as it is not proved the argument is powerless. For suppose (Ward is not averse from hypothetical cases) that our own vision began with black and white, and that blue and yellow were added some years later, and red and green later still. Here we should have both chronological order and physiological dependence; and would red and green cease on that account to be sensations? We need not, however, stretch our imagination so far. Why should not an eye, capable of black-white vision in daylight, open for the first time upon a black, upon a patch of burned-over grass or the mouth

¹ "A Further Note on the Sensory Character of Black," *Brit. Jour. Psych.*, Vol. VIII., 1916, pp. 212 ff.

of a large cave? Physical light would be there, but the organism's first visual experience would surely be a black.²

2. I had said that we might, but for habits of expression, speak in psychology of "the darks" as we now speak of "the blacks." Ward appeals, in support of his own view, to the language of every-day life. "For it there are various darks, always implying 'shade';" while "there is only one true black, predicated not of colors, but of things or forms as their color." I am sure, nevertheless, that common speech gives the name of black to a number of different qualities. I have never known a student, however naïve, to call the Hering paper-black "gray"; the two Hering blacks are distinguished as dull-black and black, or as black and velvet-black. Ward himself, in the paper now under consideration, uses the phrases "increasing black" and "deepest black"; Hering, in a passage which Ward refers to, uses the phrases "*auffallend schwärzlicher*" and "*ein nicht allzutiefes Schwarz*." I am sure, too, that the terms dark and black are often interchanged; has not Ward just spoken, indifferently, of "black" and the "experience of darkness"? So Field's Chromotography tells us that "when black and white are contrasted the former appears darker"; and what does that mean but blacker? So we speak metaphorically of dark deeds and black crimes, of dark hours and black days, of a dark future and a black prospect. Finally, the dictionary shows that black may be predicated of colors. We find the compounds black-blue and black-brown as well as blue-black; and we can speak intelligibly of a blacker brown or of a blackish olive.

The distinction drawn in every-day life between black and dark, so far as it is drawn at all, seems rather to suggest the psychological distinction of superficial and roomy colors: black is superficial, like the color of colored paper; dark is roomy, like the color of a transparent liquid. Katz has shown, however, that both of these modes reduce, in the last resort, to areal colors, the type of which is the color seen in the spectroscope.³ In this sense, therefore, black does not reduce to dark, nor dark to black; but both superficial black and roomy dark reduce to an areal quality. "In the last resort possibly one may be resolved into the other; but it will make all the difference which." Unfortunately for Ward's argument, observation reveals the third term.

3. The physiologists "begin by laying down psychophysical principles to which they appeal. To every *psychosis* there is a causal

² Ward's argument is couched in empirical terms, and I have tried, both here and in my earlier paper, to reply empirically. If he means only that the positive is *logically* prior to its negative, I should agree, though I should deny the applicability of this logical principle to the case of white and black.

³ D. Katz, "*Die Erscheinungsweisen der Farben*," 1911, pp. 36 ff.

or at least a corresponding *neurosis*, is the chief of these. We ask them for the *neurosis* answering to black. For all other visual sensations the physical stimulus is obvious—ethereal vibrations of some kind; but there is [no] such direct stimulus for dark or black. If there is a stimulus at all it must be an internal state or change of some sort in the visual apparatus itself, retinal or central or both.” One almost wonders, on reading this passage, how Ward would define a *neurosis*! and there are plenty of sensations whose correlated stimuli are “internal.” In the present case, the nature of the internal stimulus is in dispute. Von Kries, reminding us “*wie wenig uns überall von der Umsetzung der Reize in die nervösen Vorgänge bekannt ist*,” adds the express warning that our current knowledge does not permit of argument from the sensory character of black to the corresponding psychophysical processes, retinal or other. But how does this ignorance affect that sensory character itself?

4. Ward thinks that I have not directly faced the question of the analogy of black to silence. “Darkness and black in vision seem analogous to silence and pauses in sound, why then should the absence of sensation, generally conceded in the latter case, be disallowed in the former?” I tried to face this question squarely; I denied the analogy, and gave my reasons. Silence I take to be what we *mean* when we say “How quiet it is!” In its least complicated form it is, psychologically, a perception; and its observable constitution, like that of perceptions in general, may vary within wide limits. Sometimes this constitution is auditory, sometimes it is organic or kinesthetic or visual, usually it is mixed; I am talking not of detachable accompaniments, but of constituent factors. In Boecklin’s *Schweigen im Walde* or *Toteninsel* one sees the silence as immediately as one sees the sweetness of a ripe plum or the weight of a garden roller; and there is no violence done to language in the words “How quiet this place looks!”⁴ To argue that, because logically or physically silence is the absence or cessation of sound, therefore the psychological analysis of an experience of silence shall reveal nothing but an auditory blank (however that may be observable!), seems to me to be unwarranted. The right method, at all events, is to catch oneself on occasions when one is thinking “How quiet it is,” or to create such occasions experimentally, and to set down the results of one’s observation. I followed this method in the case of silence, and I quoted Meumann for that of pauses in sound; I showed that the

⁴ I must now admit that references to silence *heard* occur not infrequently in literature. I find in de Maupassant: “*J’aime la nuit . . . avec mes oreilles qui en écoutent le silence*”; but the author continues: “*J’entends rôder mes soeurs les bêtes et mes frères les braconniers*” (“La Nuit,” Cauchemar). Mr. A. S. Oke, of Cincinnati, has kindly called my attention to a like passage in the first act of Ibsen’s “When We Dead Awaken.”

"auditory blank" was not found or reported. How could I have met the issue more directly?

5. "Against Professor Titchener's *dictum* that 'black is not indispensable to the painter's palette,' I may set Leonardo da Vinci's that it is." Did I rise to the height of a dictum? I gave a brief summary of facts, which Ward might easily have verified. But I am quite willing to go into further detail.

I suppose that every great painter has a love of black, though some (take Constable for an instance) have loved it too well. I suppose, too, that every painter is all his life long experimenting with his palette; Reynolds is an obvious case, and Reynolds had palettes which dispensed with black. What I had in mind when I penned my "dictum" was, however, the change that passage of time has brought about in the pictorial treatment of light and shade. It is hardly too much to say that we owe everything to Da Vinci; were it not for Da Vinci's pioneer work in *chiaroscuro* Ruskin could not have written, as he did, that shade in the ordinary landscape is just as much color as light is.⁶ That, surely, is the point. Black to-day is not essential to the representation of shade; black is a color, like the other colors, to be used or not as occasion requires. (One can not look over a collection of Japanese color-prints without realizing the decorative value of black, its value as a color among colors, quite apart from light and shade.) We have come slowly to this understanding: but consider a group of pictures by Turner, or Fortuny, or Puvis de Chavannes, or Sorolla, or Monticelli, or Hassam, above all by Monet, and there will be canvas upon canvas whose analysis shows no trace of black.⁷ We all know what Whistler did with black in his studio-pictures; but a whole series of nocturnes may be blackless. Cottet and the Black Band were not returning to Da Vinci; they were using black as the key-color of their palette, just as the impressionists before them had used blue. This, once more, is the point that I was making in my reply to Ward: modern painting does not turn to black, as a matter of course, for the rendering of shade; black may now be used for its color, for its own sake; a painter will employ it or not, according to his subject, his skill, his personal preferences. It seems to be freely used by the Futurists, possibly by way of reaction against the luminous landscape of the Monet school. However that may be, I stick to my statement that it is not indispensable to the modern palette.

6. I am still puzzled by Ward's parallel of light and sound contrast. He acknowledges that the constant and variable stimuli

⁶ See esp., "The Elements of Drawing," § 178; "Lectures on Art," §§ 131, 134, 175. Other references are given in the General Index to the edition of Cook and Wedderburn.

change places when the transfer is made: the variable sound produces increasing stillness, the constant gray produces an increasing black. In order, however, to get the increase of black he now lays this constant gray (as he did not before; at any rate, nothing was said of it) upon light-fields of increasing intensity. Under those conditions, certainly, the mixed contrast-effect would be a deepening black, provided that the rate of objective change outran the rate of adaptation.⁶ But there are then, subjectively, two variables, the blackening gray and the lightening white. In the other case there is, by hypothesis, but one subjective variable, the steadily diminishing sound. Why should we "attribute" the contrast only to the blackening gray, and leave the lightening white out of account?

When I first read Ward's description of the two contrasts I supposed that he had in mind an actual experiment. I therefore tried the observation, with electrically-driven forks, and found no trace of auditory contrast. After criticizing my result in terms which I do not understand (unless he is identifying fusion with consonance) Ward remarks: "Anyhow 'sounds' is the word used, not 'tones.'" I take it, then, that he intended only a *Gedankenexperiment*. But can one even imagine a strictly simultaneous contrast of sounds? Must not the sounds be thought of as they would be given in perception, if contrast were to be present there: given, that is, successively, in alternate pulses of attention? And then where is the parallel? We have in the one case a simultaneous (really, a mixed) qualitative (or qualitative-intensive) contrast with two subjective variables, and we have in the other case a successive intensive contrast with one subjective variable.

Criticism of this sort would be captious if Ward were merely illustrating his argument, and if he meant the illustration to be taken only at its most obvious face-value. He appears, on the contrary, to base argument upon the illustration, and to regard his two instances as definitely parallel in psychological analysis. Here I can not follow him.

7. "To say that whereas a sensation of light may be blinding a sensation of black may be 'impenetrable' seems curiously awry." I am sorry that I do not see the reason. To say that white is dazzling and black impenetrable is, to me, like saying that the highest tones are piercing and the lowest voluminous, or (in Passy's sense) that camphor is a strong and vanilla a faint odor, or again that red is exciting and blue restful, or that brown is heavy and yellow light (in weight or body). The adjectives serve, more or less directly, to

⁶ The reference to Hering does not meet the point; Hering is speaking of momentary observations successively made, Ward of a continuous observation. See "Grundzüge," p. 118.

characterize some phase of sensory experience, and the pairs go together naturally. If we do not speak ordinarily of a blinding black, that is because it is normal for us not to discriminate in the dark, while we expect to see things in the light; the popular delusion that the blind live in darkness may also have something to do with it. Tennyson hits the mark in his "blind wall of night"; it is precisely the wall-like character of black, its dense impenetrability, that corresponds with the dazzle of white.

Two minor points must be touched on. I regard the painfulness of excessive light, in so far as it is sensory and not affective, as muscular and not as retinal; just as the painfulness of piercing sounds is muscular. As a matter of fact those of us who are "night-blind" suffer in the dark from an eye-strain whose muscular quality definitely recalls the muscular pain of a dazzling light. Secondly, I do not consider that black and white, red and green, are as sensations antagonistic. The color-pyramid, which shows the sum-total of visual sensations in psychological arrangement, does not show complementarism.

8. I had said that in certain modes of experience, under certain special conditions, the logical distinction of negation and privation disappears for the psychology of sensation. Ward apparently believes that there is a necessary term-for-term correlation between logic and psychology; at all events, my statement grievously shocks him. At first he declares himself uncertain "with what limitations, if any, this striking deliverance is to be understood." Presently he forgets that there may have been limitations. Quoting from Wundt the sentence *Schwarzempfinden und Nichtempfinden sind zweierlei*, he ends his paper with the remark: "In other words, the privative and the negative are not the same! So I had already said, though Professor Titchener does not agree." As if I had ever dreamed of identifying black-vision with non-vision! And as if the distinction of negative and privative held for Wundt's formula on any other view than Ward's—which is not Wundt's and not mine—that black is a negative quality! And as if I had anywhere discussed, at large and in general, the psychological correspondences of the logical distinction!

9. I suggested that colors disappear in high light as well as in the dark, and Ward thinks it pertinent to rejoin that this "is just an empirical fact that might conceivably have been otherwise." That is an argument to which, I confess, I have no reply. Ward, it is true, is not satisfied with the bare dismissal of the fact. He continues: "Albeit it is an instance of a wider psychological generalization, that 'presentations of medium intensity are clearest' (cf. Ebbinghaus, 'Grundzüge der Psychologie,' 3d ed., I., p. 752). Also

the fact that the color seen is a genetic differentiation of the light-sense helps to explain it."

The generalization (which comes from Dürr, by the way, and not from Ebbinghaus) is, however, quoted only in part, and that part only in abbreviated form. Dürr is discussing the conditions of attention, and writes: "Favorable to the clearness and distinctness of presentations (*Vorstellungen*) is a moderate intensity of the sensations contained in them, as well as everything that furthers their qualitative distinction (*Abhebung*) from one another and from their psychical milieu; here belong in particular, beside the moderate intensity which again comes into account, relations of contrast between the sensory qualities." We note, first, that Dürr is here concerned with but *one* of the conditions of attention; other and co-ordinate conditions are mentioned in later paragraphs. We note, secondly, that he offers his statement with reserve, and introduces it by a *vielleicht*. We note, thirdly, that he is dealing with the *Bewusstseitsgrad* of *Vorstellungen und Gedanken*, not with sensations; it is clearness and distinctness of apprehension (*des Erfassens*) that suffers from the highest degrees of sensory intensity. Suppose, nevertheless, that Ward's summary of Dürr's law were adequate; suppose that there were no further condition of attention; suppose that the law itself should command universal assent; and suppose that it held for sensations as well as for *Objektivitätsfunktionen*: what then? It would still be a summarized statement of empirical facts which might conceivably have been otherwise.

Ward's concluding argument, if I understand it, is that, since the color-sense is derived from an earlier light-sense, therefore colors will be seen most clearly neither in the highest light nor in the dark, but over a certain mean region of light-intensity. It must be remembered, however, that Ward recognizes only a single quality of light, ranging from the terminus to zero. With that single quality for starting-point it would be equally plausible to argue that colors should be seen at their best in maximal illumination. The underlying psychophysical process, that is to say, would differentiate when the adequate stimulus operated at its highest intensity, and this same intensity would thenceforth be necessary to the clear discrimination of the colors seen. It would seem, then, that logic works both ways, and that we are, after all, brought up sharply by the empirical facts, which might conceivably be otherwise, but are obstinate enough to be what they are.

E. B. TITCHENER.

MR. LEWIS AND IMPLICATION

THE theory of implication developed by the symbolic logicians seems to have aroused a considerable degree of antagonism among certain students of Logic. There are many philosophers to whom you can not mention the name "Russell," without evoking such comments as, "His logic is purely artificial, for it is nonsense to suppose that a false proposition implies any proposition, or that any proposition implies any true proposition," or, "Who could ever reasonably maintain that, 'The moon is made of green cheese,' implies, 'Caesar died in his bed!'" Most of these critics have not expressed their objections to Mr. Russell's position in black and white, so that it is impossible for us to see just in what the strength and the weakness of their arguments consist; Mr. C. I. Lewis, however, has had the courage of his convictions and has developed his criticisms of the views of Mr. Russell together with certain very interesting logical theories of his own in a series of articles which have appeared partly in *Mind* and partly in this JOURNAL.

The sum and substance of Mr. Lewis's objections to Mr. Russell is this: Mr. Russell, following the older symbolic logicians, holds that a false proposition implies any proposition and that any proposition implies any true proposition. That is, p implies q if either p is false or q is true. Mr. Lewis claims, and not without a certain degree of justice, that this is not what we ordinarily mean by implication. We do not, for example, usually say that, "Socrates was a solar myth," implies, "All triangles have two or more sides." Therefore, as Mr. Lewis tells us, "Not only does the calculus of implication contain false theorems, but all its theorems are not proved. For the theorems are implied by the postulates in the sense of 'implies' which the system uses. Hence *it has not been demonstrated* that the theorems can be inferred from the postulates, even if all the postulates are granted. The assumptions, *e. g.*, of the 'Principia Mathematica' imply the theorems in the same sense that a false proposition implies anything."¹

Mr. Lewis's reasoning here is fallacious, and the fallacy he commits is that of denying the antecedent. From the fact that if a set of postulates deals correctly with our ordinary relation of inference, it will yield us a correct logic, he infers that if a set of postulates fails to deal with this relation, and, like the Russellian logic, seizes upon some other relation as its fundamental notion, the logic to which it leads must be faulty and incorrect. This is a manifest and a grave error; it is conceivable that we may develop a valid theory

¹ This JOURNAL, Vol. X., p. 242.

of demonstration, the fundamental notion of which is other than what we ordinarily call inference, which is correctly derived from its own postulates. It is not necessary that a theory whose purpose it is to yield us a norm of valid inference should itself in the first instance be a theory of inference. We say that one proposition can be inferred from another if there is a certain relation between them such that we are compelled to accept the former proposition as true if we accept the latter one. The purpose of Logic, in so far as Logic is a norm of inference, is to provide us with certain methods which, when applied to any true proposition of a suitable sort, will yield us other true propositions. These methods need not of themselves involve any reference to the concept of inference, and may not lead us to realize that they are methods of inference. Indeed, they can not lead us to realize that they are methods of inference, even if they actually concern themselves with such methods, for then they would form a portion of their own subject-matter, and we should be involved in that philosophical lifting of oneself up by one's boot-straps, the pernicious consequences of which have been pointed out so well by Mr. Bertrand Russell in that part of the "*Principia Mathematica*" which deals with the theory of types. If the natural history of the process of inference is a branch of Logic, it is a Logic of a very different type from that which it is the purpose of the logicians to develop, and there is no reason under the sun why this latter Logic should be doomed under penalty of death to make use of our every-day notion of implication.

The only questions, then, which can reasonably be asked concerning the correctness of the Russellian Logic are, Is it actually a correct norm of valid inference? and, Is the coherence and self-consistency which it claims for itself, and tries to justify by an orderly derivation of its theorems from a small and simple set of postulates, genuine or factitious? As we have already seen, Mr. Lewis answers both of these questions in a manner adverse to the claims of Mr. Russell, but we have found his arguments to be fallacious. To arrive at the true answer to these questions, we must discuss what the function of postulates is in a deductive system such as the Russellian logic. Now, the main function of the postulates of any system is to stand as hostages for the system: they must be statements, the acceptance of which commits one to the acceptance of the entire system as true. That is, we must be able to affirm that the system of propositions is true, unless, by chance, the postulates should fail to be satisfied. This is not to be taken, as Mr. Lewis seems to be in danger of taking it, as the assertion of any occult connection or motive force acting between the postulates and the system: there is no need for us to suppose that the truth of the propositions is conditioned in any

causal way by the truth of the postulates. That either the postulates are false, or the system of propositions is true²—this is all we need know concerning the relation which the postulates of Logic bear to the system of logical truths, since this is enough to secure for us that the truth of the propositions of Logic must be maintained by any one who believes in its postulates. It matters not whether the disjunction expressed in this last proposition be what Mr. Lewis calls “extensional” or what he calls “intensional”:—if it is a mere extensional disjunction, such as can hold between two unrelated and mutually irrelevant propositions, then we may have attained our knowledge of the truth of the propositions of logic independently of our postulates, but we shall have attained it, nevertheless. So long as the conditions of the truth of our theorems are not incorrectly extended and expanded, the question of the genesis of such propositions as we accept as true has no interest for us, except in so far as it is bound up with the question of their validity. The knowledge of the postulates must be a sufficient ground for a knowledge of the theorems:—if we find that it is more than sufficient, and that we do not need a previous knowledge of the postulates to attain to that of the theorems, so much the better. If, that is, we interpret Mr. Lewis as maintaining that we are justified in inferring one proposition from another whenever we are able to proceed to the first from the second by a valid process of reasoning, then, since we are clearly bound to accept the Russellian theorems in the Algebra of Logic if we accept the Russellian postulates, we must maintain that the Russellian postulates

² In an article entitled, “A Too Brief Set of Postulates for the Algebra of Logic” (This JOURNAL, Volume XII., p. 523), Mr. Lewis makes what practically amounts to the claim that the postulate, “Any true proposition implies all true propositions,” is a sufficient basis for the whole of logic, or rather, that the methods of the Russellians should lead them to this conclusion, which Mr. Lewis regards as very objectionable. The grounds on which Mr. Lewis bases this claim are that since this postulate is true, and since it tells us that any true proposition implies any true proposition, it implies (in its own sense, which is also that of Mr. Russell) any true proposition whatever. There is no question that Mr. Lewis’s postulate does actually imply any true proposition, but this is not the entire function which a postulate must fill. The fact that any proposition in a mathematical system, so it seems, can be made a member of some set of postulates or other, simply goes to show that the primacy of the postulates of a mathematical system is a primacy in the order of knowledge, not in the order of existence. I need not say, however, that even this primacy of the postulates of a system refers only to their status within a given investigation. Now, it is obvious that this priority in the order of knowledge can not be claimed for Mr. Lewis’s postulate. It is for this reason that I have said that the fact that either a theorem must be true or a set of postulates false is all that we must *know* for us to be able to say that they imply the theorem, and not that it is all that need be true to render the latter statement true in its usual sense.

imply the theorems, not only according to their own peculiar definition of the relation of implication (which may, indeed, have but little in common with the ordinary definition of that relation), but precisely according to our usual understanding of the relation of implication. Now, this is taken by Mr. Lewis himself as the ultimate criterion of the true nature of implication.

It may be objected by some that the relation of implication by which we obtain the theorems of logic from its postulates—or, indeed, any theorems from any postulates—is not merely the Russellian relation of material implication, which a false proposition bears to any proposition and any proposition to a true one. As Mr. Lewis says, “Euclid’s parallel postulate or Lobachevski’s postulate about coplanars is—one of them—false. Nevertheless, he errs who would take either postulate to imply anything and everything. Logical consequences follow regardless of truth or falsity of premises.”³ (Mr. Lewis’s statement here is unquestionably true. Mr. Russell’s material implication is not adequate to the deduction of the theorems of geometry from their premises, and it might be thought that it is still less adequate to the deduction of the theorems and propositions of logic from Mr. Russell’s set of primitive propositions. This, however, is not the case. There is, as Mr. Lewis himself recognizes, a vast difference between the postulates of logic and the postulates of geometry. “Pure mathematics is not concerned with the truth either of postulates or of theorems: so much is an old story . . . Indeed, the attempt to separate formal consistency and material truth is, in the case of the logic, peculiarly difficult.”⁴) That is, pure mathematics is concerned only with the question whether the theorems follow from the postulates, while logic must take its postulates and theorems as both true. A mathematical set of postulates can be investigated without any reference to an actual system which in reality embodies them, while the postulates of logic, in so far as they remain postulates of logic, must be regarded as actually embodied in the constitution of every system. The postulates of geometry are hypotheses, or *types of possible truths*; the postulates of logic, if they are correctly stated, are *truths*. Now, a hypothesis or type of truths is not a proposition. The postulates of geometry, *qua* postulates of geometry, may apply indifferently to points in space or to number-triads or to any other sort of entity you please, and are on this very account neither true nor false in themselves, but only in their particular manifestations. Since they are neither true nor false, and hence not propositions, it is nonsense to speak of their implying anything or being implied by anything in the same way in which we can speak of propositions,

³ This JOURNAL, Vol. X., p. 432.

⁴ *Ibid.*, p. 429.

such as the postulates of logic, as implying or being implied by something. It is only natural, then, that it should be permissible to use methods in deducing the theorems of logic from their postulates which are prohibited in the case of the postulates and theorems of geometry. It is by virtue of the very distinction between logic and other branches of mathematics, which Mr. Lewis stresses so strongly, that the objections which he raises against Mr. Russell's employment of the relation of material implication in the development of his theorems may be shown to be irrelevant.

The relation of implication which the postulates of geometry bear to its theorems deserves a further consideration, for a misapprehension of the nature of this relation is at the bottom of most of Mr. Lewis's errors. The postulates of geometry, as we have seen, are not propositions, but blank forms of propositions, which may be filled in in a countless number of different ways. Thus the postulate, "Any two points are connected by one and only one line," may be filled in with a content consisting of actual spatial entities, or of number-triads (in place of points) and pairs of linear equations in three unknown quantities (in place of lines), or with any one of an infinity of other possible specific determinations. Now, Mr. Russell denotes a blank form for propositions by the names, "universal" and "propositional function." Moreover, he has given a definite and complete discussion of the relation of implication between propositional functions, which he calls the relation of *formal implication*. A propositional function ϕ is said to imply another ψ formally if every entity which fills out the blank form ϕ into a true proposition also fills out the blank form ψ into a true proposition.⁵ Thus to say that the postulates of geometry imply the theorems formally is to say that every system which satisfies the postulates of geometry also satisfies the theorems of geometry. This is manifestly true of the postulates and theorems of our geometry, and constitutes a necessary condition for the validity of the latter. A little reflection will convince us that it is also a *sufficient* condition, for otherwise we should have theorems not implied by the postulates of geometry, but true of all geometrical systems. This means of all *possible* geometrical systems, for a geometrical system is a universal, and the possibility of a universal is identical with its actuality. Now, we should ordinarily say that any proposition follows from a given set of postulates, if it is true of every possible system which satisfies these postulates, on the ground of the very nature of universals themselves. As a consequence, we see that Mr. Russell's notion of formal implication among universals is in every respect in harmony with our every-day use of the term.

⁵ Whitehead and Russell, "Principia Mathematica," p. 21.

It is this relation of formal implication which Mr. Russell always uses when he derives the theorems of any mathematical system, such as that of linear order,⁶ from their postulates, and the correctness of his view of the nature of implication is substantiated by the fact that in every case his results have agreed with those of other mathematicians who have made use of the same postulates.

It may be objected to this analysis of the relation of implication between postulate and theorem, that the relation of implication still holds, and differs from that of material implication, when our postulates are propositions concerning specific objects, and not mere propositional functions which may apply to anything at all. I think, however, that it is only in so far as they are taken as the representatives of propositional functions that propositions imply anything in this sense. When I deduce the properties of actual space from Euclid's postulates, I am really deducing conclusions from certain laws which an infinity of systems may satisfy, and which our space does satisfy, and I am applying them to our space. The possibility of a reference to other systems plays an essential part in the deduction. So, too, when I say, "If it rains, I shall get wet," the real implication which I desire to assert is, "*In any situation such as the present, when it is raining on me, I get wet.*" The tacit, "other things being equal," which may always be prefixed to such implications, points out the universality of reference which such implications are intended to have, as will be seen if we write it, "whenever other things are equal." This explains the unnaturalness of such material implications as, "If two and two are four, Caesar is still alive," for there is no obvious general law or formal implication to which they may be reduced as instances.

The reason why Mr. Lewis seems unable to understand the significance or even the nature of Mr. Russell's formal implication appears to be that he ignores the distinction between propositions and propositional functions. Hence he regards $(x) : \phi x \cdot U \cdot \psi x$, the relation of formal implication between two laws, as but a particular instance of what he calls "strict implication," which relates propositions.⁷ Further on in the same article, he speaks of "cases" of the truth or falsity of a proposition, while a proposition, unlike a propositional function, is either simply true or simply false, and can have no instances of truth or falsity. These slips are particularly regrettable in the case of a man who has published so extensively on logistical matters as Mr. Lewis has. If Mr. Lewis disagrees with Mr. Russell's distinction between propositions and propositional functions, he should have made the fact of this disagreement clear before setting forth on his

⁶ "Principia Mathematica," Vol. II., Part V.

⁷ This JOURNAL, Vol. X., p. 430, note.

criticism of Mr. Russell's logistical views, a heart and soul of the Russellian logic.

Mr. Lewis's arguments against Mr. Russell's theory of modality, and one feels that they were developed out of his constructive work in the definition of his "implication," which really requires no such apology. This is not the place here for me to comment upon this valuable and interesting piece of work, except to say that its worth is utterly independent of an acceptance or rejection of the objections against Mr. Russell. One may grant that the system is both a logic and a self-subsistent system, an obvious fact, which it is to Mr. Lewis's credit that he is unable to distinguish between the notion of truth which results from the laws of logic alone.⁸ The logic developed here gives an account of this notion, and is, in so far as it is a paratus—though not necessarily more complete than that of Mr. Russell. In the form which it finally takes, the distinction between *de facto* and necessary truth, disjunction, and implication. The system is, with great patience and ingenuity, and takes the form of a logical correctness.⁹ It is, however, a supplement and not a refutation of it.

HARVARD UNIVERSITY.

SOCIETIES

NEW YORK BRANCH OF THE AMERICAN ASSOCIATION

THE New York Branch of the American Association met in conjunction with the Society for the Psychology of the New York Academy of Sciences, 1, at Columbia University. The following is a summary of what was read:

⁸ Cf. "The Matrix Algebra for Implication," *Journal of Philosophy*, 589-600. This represents the most finished form of the work.

⁹ Mr. Lewis fails to include among his "laws" the law $\sim(\sim p = \neg p)$, which would definitely distinguish his system from the traditional logical calculus. He also states it as a theorem that equivalent propositions may be substituted for one another in any context capable of proof, so far as the operations concerned, on the basis of his postulates, and as a theorem of proof. These are, however, only minor inadequacies of the Lewis "Algebra of Logic" itself.

Some Empirical Tests in Vocational Guidance and Selection.—

HERBERT W. ROGERS.

The speaker gave a brief synopsis and critique of (1) the sources of demand, (2) primitive methods, (3) current business methods, and (4) modern scientific methods of vocational guidance and selection.

Since all the other methods of determining an individual's fitness for an occupation were found to be inadequate the speaker presented the results of a research, the aim of which was to test out in practise the method of the empirical vocational tests and to find out if they were tests of specific functions and were of practical significance. The type of work selected for correlation with the tests was the work included under the term stenographic ability. The tests were given to a group of forty-five students of stenography and typewriting. The results of the tests were correlated with the instructor's mid-year grades of ability in stenography and grammar; and every month, for seven months, with the net number of typewritten words per minute. This latter method demonstrated the uniformity of the correlation. Correlations below .40 were discarded. Correlations above .40 (the highest being .61) were teamed, producing correlations between .55 and .70.

There were many factors which tended to lower the correlation, which could be, in part, eliminated if the research were repeated. Under more favorable conditions a series of tests could be found which would be a criterion for a system of vocational guidance and selection in the stenographic profession. None of the tests which correlated above .40 in typewriting was correlated to that extent in either stenography or grammar. Thus the tests do, to some extent, test specific functions and processes. All the data of this experiment are open to inspection.

The Visibility of the Nerve Current.—CHRISTINE LADD-FRANKLIN.

This paper will be printed in full later.

Taboos in China.—T. T. LEW.

The study of taboos in China is a very fruitful field, for no systematic treatise of any note has been made. It is a very significant study, for if properly made it will serve as a key to many intricate problems concerning the religious and social life of the Chinese people. Among the difficulties to be encountered are the following: The Chinese people have a very scanty history on non-political and non-literary subjects, and further the country is so large and has such diversified customs and living conditions that it is extremely risky to make generalizations on any subject concerning her people.

The paper was prepared from the personal experience and ob-

servation of the writer, with help from literary students from the various parts of China and America.

Sixty different taboos were described and main groups: (1) taboos of persons, (2) taboos of things. The third class was subdivided into things, names, words, days, and colors. The author compares some of the customs of Europe and America with these taboos. Such a sharp contrast is shown. Such a sanction of taboos, their enforcement, abrogation, and transmissibility were discussed.

The taboos were interpreted, wherever possible, in the history, current thoughts, and practice of the people. Explanations are offered to account for the different ideas of cleanness and uncleanness, (2) the philosophy of adversity, (3) the idea of sacredness and the idea of approval and disapproval, (5) pseudo-scientific and purely ethical considerations.

The significance and outlook of taboos were noted. Factors are working toward the elimination of old taboos, and the substitution of new ones, especially new customs and modes of living. The changes are noted from the point of view of social psychology and religion.

How Psychoanalysis Cures Nervousness.—S. BAUM, M.D.

The author gave a brief review of the Freudian origin and meaning of the psychoneuroses (apart from hysteria, and obsession neuroses), of the tremor of conscious mental activities, psychic conflicts, and their effect on daily life, and how these lead to the development of the technique of the psychoanalytic method was outlined. The treatment brings about the cure of the patient under nine headings: (1) Catharsis. The patient is given speech and action to the pent-up emotions, hence "the talking cure." (2) Relief of Fear, which the patient is convinced that he is suffering from a disease which is not insane or bewitched. (3) Enlightenment. The result from erroneous beliefs and these are cured when the patient learns the truth. (4) Reconversion of the patient. The psychic symptoms are often only the expression of the patient's dictiveness, self-punishment, etc. (5) Substitution. An emotional complex is often only the reaction against the contrary emotion, e. g., exaggeration.

pressed animosity. (6) Confession. The neurotic is an unconscious criminal and sinner. The treatment enables him to discover and confess his unacted crimes and sins and thus he is restored to the people about him. (7) Transference. As a result of the attachment for the psychoanalyst the patient takes a livelier interest in the world and develops a strong desire to be cured; the physician becomes the connecting link between the neurotic and the rest of the world. (8) Sublimation. The patient is encouraged to apply his newly found energies to more noble purposes than the maintenance of neurotic symptoms. (9) Suggestion plays a very small rôle in the treatment. All these mechanisms were illustrated by reference to patients who had been treated and cured by the speaker.

A. T. POFFENBERGER, JR.,
Secretary.

COLUMBIA UNIVERSITY.

REVIEWS AND ABSTRACTS OF LITERATURE

Psychological Effects of Alcohol. An Experimental Investigation of the Effects of Moderate Doses of Ethyl Alcohol on a Related Group of Neuro-muscular Processes in Man. RAYMOND DODGE and FRANCIS G. BENEDICT. With a chapter on Free Association in collaboration with F. Lyman Wells. Washington: Carnegie Institution, Publication No. 232. 1915. Pp. 281.

In 1913 the Nutrition Laboratory of the Carnegie Institution circulated a "tentative plan for a proposed investigation into the physiological action of ethyl alcohol in man" and a proposed "correlative study of the psychological effects of alcohol on man." During the academic year 1913-14 Professor Dodge and Dr. Wells conducted investigations on a related group of neuro-muscular processes. The present volume is a report of the results of this work. It is a well-printed volume, with thirty-three excellent illustrations. Some 65 pages are devoted to detailed accounts of apparatus and technique, and nearly 100 pages to the tabular presentation of the original data.

The investigation was admirably conceived, with a model comprehension of the intricacy of the problem, the technical requirements, and the art of presentation and interpretation. No brief review can do justice to the technical care and skill which the treatment of every problem evinces. The report will serve for a long time as a classic example of the experimental methods of "dynamic" psychology.

The first chapter describes the general plan of the investigation, the selection of the experimental processes, the methodological and statistical considerations and difficulties, the subjects, the dosage, and the general arrangement of apparatus. The subjects included a total abstainer, a group of moderate users of alcohol, an excessive drinker, and three psychopathic subjects under treatment for excessive alcoholism. The neuro-

muscular processes investigated were the patellar reflex (latency, extent, refractory period); the protective lid-reflex to noise stimulus (latency, extent, refractory period); eye reactions to suddenly appearing peripheral stimuli; speech reactions to words; free association reactions (latency, character of response, concurrent pulse changes); verbal memory; sensory threshold for faradic stimulation; reciprocal innervation of the middle finger; speed and accuracy of fixation eye-movements; pulse rate during mental and physical work. These processes were selected as representing in a systematically coordinated way the various levels of the neuro-muscular system. Their particular choice was also determined in part by the immediate availability of certain techniques and by the fundamental and unambiguous character of some of the arcs involved. No attempt will be made here to indicate the specific instrumental, statistical, and methodological procedures. Those interested in these aspects of the study should by all means consult the original report. An interesting methodological point is involved in the decision to abandon the regular use of control doses. The statistical procedure follows methods already used in recent drug experiments, and the experimental technique was in general such as is already closely identified with the work of the authors.

The effects of moderate doses of alcohol (mainly 30 c.c. and 45 c.c.) may be briefly indicated here. The most striking effects were in the case of the knee-jerk. Alcohol here increased the latent time 10 per cent. and decreased the extent of muscle thickening 46 per cent. The latency of the lid-reflex was increased 7 per cent. and the extent of movement decreased 19 per cent. In general, the sensory threshold for electrical stimulation was raised some 14 per cent. Coordinated eye movements were decreased 11 per cent. in speed, and finger movements 9 per cent. The reaction times of the eye and the speech organs were increased 5 per cent. and 3 per cent. Free association reactions showed no definite effects of any kind. The same is to be said of the memorizing of words. The principal effect on the pulse rate is described as a "relative acceleration," by which is meant the failure of the pulse to show the gradual retardation which characterized it on normal days.

The report closes with an instructive analysis of the differential incidence of the effects of alcohol. The simple schemes heretofore relied on in the interpretation of objective changes in neuro-muscular activity are shown to be pitifully inadequate, in view of the complex organization of the neural processes involved in any single adjustment. In particular the classical work of Kraepelin is reviewed and contrasted with the outstanding results of the present investigation. In the interpretation of the results it is particularly noted that "the greatest and most persistent change consequent to alcohol is in the processes which are most completely withdrawn from voluntary reinforcement and voluntary control." The general tendency of the change is in the direction of depression of neuro-muscular action.

The difficulty of interpreting this depression in neurological terms is emphasized by an illuminating presentation of the possibilities of compli-

cation in the mechanisms of drug action. Any objective change must in all probability be conceived as the resultant of a great variety of central and peripheral adjustments, which extend also beyond the nervous tissues themselves. Having pointed out the confessed obscurities, an effort is made to analyze the data with a view to suggesting whether the obvious and measurable depression is due to direct paralysis or to the stimulation of inhibitory mechanisms. The data are believed to "give clear and consistent indications that the apparent alcoholic depression of neuro-muscular processes is a genuine phenomenon that can not be reduced to the excitation of inhibitory processes, but that, conversely, whenever apparent excitation occurs as a result of alcohol it is . . . due to a relatively overbalancing depression of the controlling and inhibitory processes." No evidence is forthcoming to show that this depression is in any sense a conservative process, such as sleep, which also depresses neuro-muscular action.

Other sections of the closing chapter deal with the analysis of the temporal incidence of the effects of alcohol; the effects of repetition on the experimental processes employed; and the correlation of the various measures in the attempt to find some single process which displays most adequately the typical alcohol effect. In the form of appendices are given also the "Proposed Tentative Programme," first circulated in 1913, and the family and personal histories of the eleven subjects.

H. L. HOLLINGWORTH.

COLUMBIA UNIVERSITY

Madame de Staël and the Spread of German Literature. EMMA GERTRUDE JAECK. Oxford: Oxford University Press. 1915. Pp. vi + 358.

France in the early part of the eighteenth century devoted most of her attention to English, but she by no means neglected German literature. At that time England had already produced her greatest poets and prose writers, while those of Germany were yet to come; it was consequently England that first attracted the attention of the French. Yet while Voltaire, Abbé Prévost, Laplace, Abbé Leblanc, and a host of others were introducing English literature, and Shakespeare in particular, on the Continent, a considerable amount of attention was given to the young writers of Germany in French periodicals such as: *La Bibliothèque germanique ou Histoire littéraire de l'Allemagne et des Pays du Nord* and *La Nouvelle Bibliothèque germanique*. Besides, a glance at M. Lanson's "Manuel bibliographique de la littérature française moderne" shows us that translations from the German were then abundant. Madame de Staël was not the first either to appreciate or to arouse an interest in German literature. Germany found many admirers of her literature in France throughout the eighteenth century, and in 1777 Condorcet in his "Eloge de Haller" exclaims: "Les Nations européennes virent avec étonnement la poésie allemande, inconnue jusqu'alors, leur offrir des chefs d'œuvre dignes d'exciter la jalousie des peuples qui, depuis plusieurs siècles, se disputaient l'empire des lettres." Among the other writers on Germany preceding Madame de Staël, Charles de Villers is perhaps the most important. He

wrote several works on German thought and literature, and was Madame de Staël's guide in everything concerning Germany; yet for a comprehensive work on Germany we must wait for her "De l'Allemagne."

Dr. Jaeck proposes to study this book and its contribution to the spread of German literature in France, England, and America. Part I. of her monograph is devoted to Madame de Staël, and part II. to the "effect of the message of 'De l'Allemagne' on the world (!)." However, Dr. Jaeck really deals with the influence of German literature in these three countries and that in an "unscientific" way, merely indicating chronologically some important translators and students of German without showing the effect that German thought and literature produced on these three countries. As regards "De l'Allemagne" Dr. Jaeck recognizes the fact that the influence of the book in England and America was not considerable.

It seems to us that Dr. Jaeck's appreciation of Madame de Staël is misleading. According to her Madame de Staël's taste and ideas were the result of her Souabian blood and of her study of German literature. Now Madame de Staël was a typical salonnière of her age who had been moved by Rousseau; otherwise she was quite French both in taste and in temperament. Intellectually she was the spiritual daughter of Montesquieu and Voltaire (especially of the former, whom she carefully studied at a very early age); emotionally she was the spiritual daughter of Rousseau.¹

Madame de Staël's literary taste had been modified by Shakespeare, Richardson, and Rousseau before she knew German. But Madame de Staël was by no means a romanticist à outrance. Not to mention her delight in Voltaire's neo-classic tragedies, consider, for example, her criticism of Goethe's "Hermann und Dorothea." "En fait de poème épique, il me semble qu'il est permis d'exiger une certaine *aristocratie* littéraire; la dignité des personnages et des souvenirs historiques qui s'y rattachent peut seule élever l'imagination à la hauteur de ce genre d'ouvrage."² To be sure Madame de Staël did not always accept the pseudo-classical "rules"; in fact she often combatted them; yet after a study of her complete work we must say that she was pretty much attached to the national traditions of her country (France).³ Madame de Staël certainly made a stupid blunder unworthy of her intelligence in having tried to treat Goethe patronizingly. "Heute habe ich zum erstenmal," wrote Goethe to Schiller (24 January 1804), "Mad. de Staël bei mir gesehen; est bleibt immer die selbe Empfindung; sie gerirt sich mit allen Artigkeit noch immer grob genug als Reisende zu den Hyperboreeren, denn capitale alte Fichten und Eichen, deren Eisen und Bernstein sich noch so ganz wohl in Nutzen und Putz verwenden liesse; indessen nöthigt sie einen doch die alten Teppiche als Gastgeschunk und die verrosteten Waffen zur Vertheidigung hervorsuholen." Forced by Napoleon to leave Paris and its brilliant conversation, Madame de Staël turned to Germany;

¹ Cf. "Lettres sur les écrits et le caractère de Jean-Jacques" (1788).

² "De l'Allemagne," 2^e Partie, c. XII., p. 171.

³ Cf. "De l'Allemagne," 2^e partie, c. XV., and "Corinne," livre VII., c. ii and iii.

but while in Germany she still remained quite French. In fact, Madame de Staël was more interested in ideas than in pure literature, and her ideas were those prevalent in France in the eighteenth century. M. Faguet rightly classed her among the *politiques et moralistes*.

We have not the space to deal more fully with Madame de Staël; besides it has already been done satisfactorily.⁴ In her chapter on "Classicism and Romanticism in 'De l'Allemagne'" Dr. Jaeck is not very illuminating; her distinctions are elementary and here again she contends that Madame de Staël's esthetic principles were changed completely by her study of German literature. As a matter of fact her taste had already been formed when she read the young writers of Germany; they appealed to her because she had already been moved by Shakespeare, Richardson, and Rousseau. The chapter on "Essentials of German Culture in 'De l'Allemagne'" attempts to be more rhapsodic than Madame de Staël herself.

In the second part of her monograph Dr. Jaeck is more satisfactory, although, as we have said, she is really concerned with the influence of German literature in France, England, and America, and not with "Mme. de Staël and the Spread of German Literature." The literary relations between Germany and France have been carefully studied; both Texte and M. Baldensperger have made important contributions to the subject. It is in the chapters on German literature in England and America that Dr. Jaeck has done some original research work. Yet here too she is more interested in chronological facts than in the effect that German literature produced on English and American thought. We must, however, be thankful to her for having begun a work that has hitherto scarcely received any attention. A complete bibliography of the subject would have been very welcome.⁵

BARNET J. BEYER.

PARIS.

A Synopsis of the Persian Systems of Philosophy. A. WORSLEY. Islington, England. 1915. Pp. 35.

A comparative study of Asiatic thought extending over a wide territorial range is contained in this monograph, published by the author as a reprint from the "Hindustan Review." Although entitled "A Synopsis of the Persian Systems of Philosophy," it would more accurately have been called a "Discussion." It deals mainly with Mazdaism and Sufism in an endeavor to distinguish their metaphysical from their religious elements and to set them in relation to the philosophies of other nations. Mr. Worsley brings to this task studious preoccupations extending from Taoism to Neoplatonism and showing especial familiarity with Hinduism.

⁴ Cf. Sainte-Beuve's "Portraits de femmes"; Faguet's "Politiques et moralistes du XIX^e siècle," for Mme. de Staël's eighteenth-century traits. Also cf. Lanson's "Manuel bibliographique de la littérature française moderne," and I. Babbitt's "The Masters of Modern French Criticism."

⁵ For Mme. de Staël and Italy, cf. M. T. Porta, "Mme. de Staël e l'Italia (con la bibliografia del soggetto)," Firenze, 1909.

There are signs that his attention to Zoroastrianism has not been that of a specialist, while in Sufi literature he seems more at home. His essay should be taken as versatile and suggestive rather than as authoritative. Since he is the author of "Concepts of Monism," it is not surprising that he looks at his subject from that angle. Monism he regards as underlying Asiatic thought generally, in contrast to the pluralism of the west, and he defines this philosophy in its negative aspects with rigor. He ventures a doubtful postulate when he seeks to evade the strong ethics of later Zoroastrianism by suggesting that Zarathushtra personally may have taught a system beyond moral distinctions and, like the Brahmins when dealing with pure philosophical values, championed simply truth against nescience. Assuredly the Lie demon (Druj) figures prominently as an enemy in the Gathas, but are not the Amesha Spentas expressions of virtue and practical good?

Monism, Mr. Worsley holds, is undoubtedly the basis of Mohammedanism and early Sufi thought, but religious fanaticism prevented the Sufis from reaching the Brahmanic level, and truth became clouded by ethical considerations. When quoting from a Sufi hymn to God, who reanimates dead hearts "with the comforting spirit of knowledge by divulging His Names," Mr. Worsley remarks that this discloses the existence of a school of logic and nominative philosophy with which he is unacquainted. Would it betray naiveté in a critic to resolve this mystery by allusion to the ninety-nine names of Allah which good Moslems tell on their beads?

In so far as the author intends to show that the specific parallels he points out between the Persian and other philosophies are due to real kinship, the critic will render a Scotch verdict—that is, if he be one who has been made sufficiently callous by rubbing against such coincidences before. Establishing blood relationships between the world's thoughts by their resemblance is like classifying the people on a city street in families by the color of their hair. To illustrate: Mr. Worsley quotes a Persian aphorism on the changeless volume of the sea as the rivers flow into it, and points out that this is an older Chinese idea. But the same figure is used in the Buddhist Pāli canon (*Udāna* V : 5 is one place where it occurs). This thought is found also in *Ecclesiastes* I : 7. It is only fair to say that the author does not commit himself very positively to theories of derivation.

On the whole Mr. Worsley's essay is interesting and provocative of thought. It is worth perusal if only to find the following: "We shall search in vain for a single instance in which a nation has voluntarily accepted a foreign religion without altering it in great measure to suit the national characteristics."

EDWARD P. BUFFET.

JERSEY CITY.

JOURNALS AND NEW BOOKS

REVUE DE MÉTAPHYSIQUE ET DE MORALE. May, 1916.
La théorie relationiste de l'espace (pp. 423-454): A. N. WHITEHEAD. — Four meanings of the term "space" are distinguished,—immediate apparent space, complete apparent space, physical space, and abstract space. The relativistic spatial conceptions are studied with respect to these spaces.
La religion d'après Cabanis (pp. 455-471): F. COLONNA D'ISTRIA. — Religion was a necessity to primitive humanity, but the ideal religion must be purified so that the irresistible feelings attaching themselves to it shall be wholly for the welfare of humanity. It then has no essential difference from philosophy.
Sur les rapports de la conscience intellectuelle et de la conscience morale (pp. 472-487): L. BRUNSCHVIEG. — "The progress of scientific criticism . . . has insensibly established a sort of equality of level between our moral consciousness and what we may call our intellectual consciousness in such a fashion that the antinomy between science and morality, which preceding generations met, has disappeared almost of itself through the single fact of profound reflection on scientific knowledge."
La théorie cartésienne de l'énumération (pp. 488-516): R. HUBERT. — A discussion of difficulties concerning interpretations of the fourth rule of enumeration.
Questions pratiques. Impartialité et neutralité (Méditation pour le temps de guerre): G. GUY-GRAND.

Dearborn, George Van Ness. *The Influence of Joy*. Boston: Little, Brown, and Company. 1916. Pp. 223. \$1.00.

Torrey, Charles Cutler. *The Composition and Date of Acts*. Harvard Theological Studies, No. 1. Edited by George F. Moore, James H. Ropes, and Kirsopp Lake. Cambridge: Harvard University Press; London: Humphrey Milford. 1916. Pp. 72.

White, William A. *Mechanisms of Character Formation: An Introduction to Psychoanalysis*. New York: The Macmillan Company. 1916. Pp. 342.

NOTES AND NEWS

THE following notice is reprinted from the *Revue de Métaphysique et de Morale* for July, 1916.

"Victor Delbos est mort le 16 juin 1916. Comme Rauh, comme Jacob, comme Hamelin, comme Couturat, il est mort dans la force de l'âge, en pleine maturité d'esprit, au moment où les plus beaux fruits de toute une vie de méditation et de labeur obstiné restaient à cueillir encore. En attendant que Maurice Blondel, son confident philosophique, celui à qui revient le soin de la publication posthume de ses œuvres, lui rende l'hommage qui lui est dû, nous venons lui adresser notre amical et triste adieu.

"Il est mort en quelques jours, emporté par un mal aigu. Mais comment se défendre de l'impression qu'il a été, lui aussi, une victime de la guerre? que, lorsque la maladie est venue, son organisme était usé par

l'angoisse des jours mauvais, par la douleur de voir la mort frapper à coups répétés parmi ses élèves chéris, par l'indignation de voir fouler aux pieds, dans des massacres sans nom, toute humanité et toute justice? Comment se demander si le caractère spécial de ses études n'avait point rendu sa situation de conscience particulièrement tragique? Après avoir assis sa réputation philosophique par un ouvrage, bientôt devenu classique, sur le système de Spinoza, c'est à étudier la pensée des grands maîtres de l'idéalisme allemand qu'il s'était appliqué. Nul en France, nul peut-être en Allemagne, n'avait acquis une connaissance plus profonde de leurs doctrines. Il avait consacré un ouvrage monumental à la 'Philosophie Pratique de Kant.' Et maintenant sans doute il n'était pas disposé à renier ses maîtres sous prétexte qu'ils avaient cessé d'être compris dans leur propre patrie. Mais un tel abîme de sang se trouvait creusé entre les deux civilisations qu'il n'éprouvait plus de plaisir à les lire; et c'est un signe de sa douloureuse déception qu'il ait, cette année, cherché comme un refuge dans l'étude de la philosophie française.

"L'extrême modestie de l'homme—nous serions tentés d'écrire l'humilité du chrétien convaincu et éclairé qu'était Delbos—n'a guère permis qu'à ses intimes et à ses élèves d'entrevoir la doctrine personnelle de ce penseur qui volontairement différa d'exprimer son propre système, toujours prêt à s'effacer pour faire uniquement œuvre d'historien, satisfait du noble rôle d'interpréter, dans sa continuité, la tradition intellectuelle du genre humain. Avec quelle excellence il tint ce rôle, tous le savent qui furent, à l'Université de Paris, ses collègues ou ses élèves, à la *Revue de Métaphysique et de Morale*, ses collaborateurs ou ses lecteurs. Il est déplorable qu'au moment où les jeunes générations sont clairsemées par la mort, les aînés disparaissent aussi. Victor Delbos manquera cruellement, le jour où, après la guerre, le moment sera venu de faire l'appel des présents parmi les jeunes gens, de former des équipes nouvelles, de réorganiser le travail: en vérité, il faut de la force d'âme pour répéter en ce moment le mot cependant plus que jamais nécessaire: 'Par delà les tombeaux, en avant.'"

ON October 26, Professor C. J. Keyser, of Columbia University, delivered an address before the assembly of Leland Stanford University on "Ways to Pass the Walls of the World." On October 27 he addressed the university meeting of the University of California on "The Ideals that are Most Worthy of Loyalty."

DR. CLARK WISSLER, of the American Museum of Natural History, continued his work during the summer with Mr. James R. Murie, chief of the Pawnee Indians of Oklahoma. With the aid of Mr. Murie, Dr. Wissler has secured many interesting rituals of the religion of the Pawnee, which is now passing away. The more important parts of these rituals have been written down as texts in the Pawnee language with translations in English.

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

KNOWLEDGE OF VALUE AND THE VALUE-JUDGMENT

IN an earlier article, entitled "Value and Existence,"¹ I reached certain conclusions which, if valid, should have far-reaching consequences for philosophy in so far as it is concerned with the relation of value and being. It was held, in the first place, that value is ultimately indefinable in terms of being or existence. It can not be conceived as a quality of being without contradiction, and to define it in terms of a relation involves a circle. I then attempted to show that value is not an object at all, but an "objective," not a "what," but a "that," a wholly unique and irreducible form of objectivity, like existence, but itself not a form of being. Over against the world of mere objects, as such, are the categories of being and value, all inclusive categories of the world.

Viewed as a whole, the present paper is a continuation of the preceding and is, in turn, itself preliminary to a final study to be called, "Ontological Problems of Value." In detail, however, it deals with certain problems which not only have an independent interest of their own, but are also in the forefront of discussion at the present time. Under the head of the "Knowledge of Value" I shall first undertake an independent study of value as *Gegenstand*, a phenomenological study of what lies in the nature of value as such. This, I hope, will have its own value irrespective of its bearing on other questions. But in so far as the development of our general position is concerned, the results of this study will, I think, be found in every sense complementary to what has gone before. At least I shall attempt to make this point. In conclusion I propose to take up the question of the "value-judgment," a judgmental apprehension of value being implied by the conclusions of both papers.

I

Value, we have said, is ultimately indefinable in terms of matter of fact, in every case a value notion, intuitively known, being pre-

¹ This JOURNAL, Vol. XIII., p. 449. This paper, like the preceding, is an expansion of certain theses presented before the American Philosophical Association, December, 1915.

supposed.² If this is so, the way to further knowledge must lie through the dialectical analysis of what lies in the value notion itself. In this respect, however, it would in no wise differ from other types of objectives about which, though they are indefinable, *a priori* knowledge is possible. That any object exists or does not exist I can, for instance, know only by experience. But there are certain propositions about existence, *e. g.*, that given any object, it must either exist or not exist, or that certain objects (*e. g.*, round squares) can not exist, I can know *a priori*. Similarly, that any object is valuable or ought to be, I can know only by experience, but it is entirely conceivable that about value itself certain propositions can be made with *a priori* evidence, and further that, given any values, they are thus *a priori* determined.

Are there then any propositions about value with *a priori* evidence? Any *a priori* elements in valuation? This question has been receiving attention from various sources recently. Thinkers representing positions as varied as those of Liebmann and Lessing, Russell and Meinong, have been seeking to fix upon those aspects of value that can be thus determined. The whole question has been greatly confused, however, by the supposition that we may know *a priori* *what* objects are intrinsically good, or that some are better than others, when as a matter of fact we can deduce the value of an object from its nature as little as we can its existence. But let us examine the question for ourselves.

One way to approach the problem of the *a priori* is to ask whether we can contemplate the opposite of any proposition. This test (the principle of the inconceivability of the opposite) has even been applied to the "matter of fact" of valuation as when it is held that there must be some ultimate absolutely determinative value judgments; such as truth is better than error, or life is better than death (Liebmann),³ or as when Russell says: "We judge that happiness is more desirable than misery, knowledge than ignorance, good-will than hatred, and so on. Such judgments must, in part at least, be immediate and *a priori*."⁴ Now that there is an immediate and *a priori* element in all such propositions is, I think, most likely, but we must take great care to find out just where it is. It can scarcely lie in the intrinsic value of truth, or knowledge, life or happiness—for while the opposites of such propositions as those above might well be intolerable,⁵ it can scarcely be said that they are inconceivable. It is perfectly possible to contemplate a world in which such preferences were reversed, in which the opposites were true. Nietzsche's

² *Loc. cit.*, p. 455.

³ O. Liebmann, "Gedenken u. Thatsachen," Vol. II., pp. 370-74.

⁴ B. Russell, "The Problems of Philosophy," p. 118.

⁵ Cf. my paper "On Intolerables," *Philos. Rev.*, September, 1915.

experiment with the transvaluation of values, whatever else it has shown, should at least warn us that whatever limits there are to transvaluation are empirical and not *a priori*. There is no value the opposite of which can not be affirmed.

The *a priori* elements must lie then in the form rather than in the content of such propositions. It is reasonable to suppose that if there are such, they will include all such propositions about value as are wholly unconcerned with actual volition and valuation (*Werthaltung*), that is, with the form rather than with the matter of valuation. Now there are, I think, in all such propositions as the preceding, and in all value judgments in fact, at least two immediate and *a priori* elements—I do not say there are no more—that are significant for our study. Otherwise stated, there are two value propositions that can be made about objects *a priori*, entirely independent of actual volition and valuation, and presupposed in all valuation.

The first of these, though at first sight empty and formal, is yet on closer inspection of real importance. It has to do with what I may call the *universality* of the value category. By this I mean that every object falls under the category of value just as necessarily as under the category of being. To every object—in the widest sense of the word—positive or negative value must be predicated. As every object is existent or non-existent, so every object is, or must appear to us to be, somewhere in the scale of positive or negative value. The latter is just as fundamental as the former.

This necessity, I hold, underlies every value judgment. That a given object has positive or negative value, as the case may be, is a matter of experience, and there is no such judgment the opposite of which may not be affirmed. But we can not contemplate any object as, if not actually at least potentially, neither one nor the other. All objects, as objects, are of interest either actually or potentially, and wherever there is interest there is value. A *wert frei* object—when value is broadly enough conceived—is a contradiction in terms.

To this view objections may be raised, but only, I think, if its meaning is misunderstood. It does not mean, for instance, that all is good, that the all of reality has positive value. We have no *a priori* knowledge of the good or bad of any objects whatever. Nor does it mean that all objects are either good or bad in the narrow ethical sense. There are objects that fall under neither of these categories. It means merely that the fact of being an object carries with it the implication of its positive or negative value as inevitably as the implication of its existence or non-existence.⁶

⁶ I am glad to find this doctrine of the universality of value presented before the Association in 1915 also held by Rickert, "*Gegenstand der Erkenntnis*," 3d edition, 1915, p. 230. He reaches it by a totally different line of argument and one which can not be reproduced here. He concludes, however, that "we

It is true, of course, that in actual valuation we find indifference to some objects, and from this psychological indifference intrinsically indifferent or *wert frei* objects are inferred. It should be clear, however, that this "psychological indifference" is really merely a refusal to value which, as Simmel has pointed out,⁷ really may have a very positive value moment. Back of it is always the possibility of interest, of which for the moment no use is made. Strictly speaking, the terms worthless, "good for nothing," do not mean merely the absence of value as the verbal form at first seems to indicate. It is always for some specific interest of the moment that they are worthless; and even the expression "good for nothing," when taken absolutely, carries with it a negative value at least.⁸

The universality of the value category may be questioned at another point. Is it objects as such that are valued, or is it *the fact that they exist or do not exist*? In other words, is it not only *real* objects, in the sense of actually or possibly existent objects, that fall under the category of value? This would exclude many objects, for instance ideal and impossible objects. It is true that ethical ideals are often not realized, but the belief in the possibility of their realization may be an essential presupposition of their value. But how about merely subsistent objects, timeless essences? And still more, impossible objects—such as round squares and unmixed happiness—which neither exist nor subsist? Both these classes of objects create distinct problems for a theory of value—problems which we must face when we come to the question of the relation of value to reality—but in so far as our present problem is concerned the answer seems to me to be unequivocal. As objects of actual or possible interest, though it be merely the specialized interest of knowledge, they fall of necessity in the sphere of value.

But this universality of the value predicate is not, we must insist, can have an object of knowledge without value as little as one without form. To think the object as fully *wert frei*, is not only to separate it wholly from the subject of knowledge, but to have it fall out of the theoretical sphere entirely." This universality can scarcely be over-emphasized. Value is not only an ultimate category, but with the exception probably of the given, objectivity itself, the most ultimate. Values, as we have seen, can not, strictly speaking, exist or even subsist. It is only the feeling or interest that exists, only the *relation* of value for a subject that subsists. But existent, and non-existent as well, may be a value. The relation of these two objectives is instructive and will be of use later when we come to consider the relation between value and being.

⁷ Simmel, "Philosophie des Geldes," p. 5.

⁸ An exact parallel to this are the "adiaphora," the indifferent acts in the sphere of morals. Strictly speaking, such acts do not exist. The distinction, good and bad, like the value distinction in general, is radical. Nothing is too small to pass through this sieve. But many acts appear insignificant and unimportant and not worth the trouble of judgment. They may be ignored, but only apparently are they *wert frei*.

a matter of experience. *That* a specific object has positive or negative value, as the case may be, and why it has value, are matters of interest, feeling, and desire; but that it must fall somewhere in the scale of value, this is *an essential form of interest and volition as such*, logically prior to any experience of desire or feeling. Over against the world of mere objects as such are the categories of being and value, all-inclusive forms of the world.

There is, however, something further that may be said *a priori* about the value of objects. It lies, we have seen, in the nature of value as such that it is, potentially at least, a predicate of all objects. It also lies in the nature of value as such that *every value stands in a system of higher and lower*. With our way of experiencing is bound up the notion that beyond the valued thing there is another thing that has another value, either more or less. It is this that gives the world of values its form. It follows from this—and the actual or potential value of all objects—that given any three values of any sort, one of them *must* be in the middle. Of any two values one must be greater than the other. An isolated value is a contradiction in terms. We know by experience that some things are better than others. But we also know—and this knowledge we can never get solely through experience—that between any two objects of value this relation must exist.

There is, we have seen it maintained, an *a priori* element in such propositions as "life is better than death," knowledge than ignorance, happiness better than misery, etc. Now the only element that I can find is precisely this necessity—that when any two value objects are brought into relation, one must be higher than the other. It is entirely possible, we have seen, to contemplate a world in which any such order should be reversed, but we can not contemplate a world where this value order itself is not, any more than we can contemplate a world in which two and two do not make four. I understand, for instance, that the order of saving passengers on a Chinese ship is the opposite of that in the western world—first the men, then the children, and finally the women. Such reversal of an order, however, leaves the *a priori* element in valuation untouched, namely, the fact of order itself. It is, I repeat, entirely possible to contemplate a world in which the opposite of any of these values—life, knowledge, etc.—should be affirmed, even a world in which non-fulfilment of tendency is better than fulfilment, death better than life, perhaps non-being better than being. Though absolute pessimism does not exist, it is not inconceivable. But given any values at all, they must take on this relation.

Both the self-evidence and the significance of this proposition may also be challenged. As to the first, an objection similar to that urged

against the principle of the universality of value may be raised. There it was the fact of "psychological *indifference*"; here it might be the fact of *actual incommensurability* of values. It might be held, for instance, with Liebmann, that "value is precisely that relation by virtue of which one object is preferred to another within the same class," but we should also insist upon the limiting words, "*within the same class.*" Within the same class of values, for instance, economic or ethical, one must indeed be greater than the other; this lies in the quantitative nature of value. But the classes themselves are incommensurable. Comparison here leads to nonsense. Comparison of actual objects is difficult enough, but how about the proposition that virtue is more valuable than a triangle?

Now as to the actual incommensurability of many values, we may indeed admit it, as we admitted the fact of psychological indifference. But this inability to determine the relations no more proves that there are no relations, than indifference proves that there are objects that fall outside the sphere of value. In so far as "existent" objects are concerned, experience indeed shows that objects apparently not comparable are really actually so. "My kingdom for a horse!" "I would give all that I own for such a letter!" Facts such as these—and the still more striking cases of the sacrifice or exchange of the ethical values of personal honor and truth—show the universality of this principle of relativity for all real or realizable objects. But it may be maintained that it is only objects that exist or have possible existence in connection with which the relation of better than holds. "All facts about non-existence are equal in value, neither better nor worse." Lessing holds⁹ that in the sphere of pure, timeless values all competition, all more and less, is meaningless. Pure value can be as little more or less valuable as truth can be more or less true. It is through reasoning of this sort that those who speak of absolute values are constrained to insist either that there are several absolute, wholly incommensurable, values (Münsterberg) or but one absolute timeless value, namely, truth, and that all other values are relative (Somlo).

It is clear that we are here face to face with a fundamental question. Is it necessary to recognize two wholly unrelated types of value? With our very way of experiencing, there can be no doubt, is bound up the notion that beyond the valued thing there is another thing that has another value, more or less. Mediation, relativity in this sense, is implied in the value notion. Are there values of which this is not true? It seems to me that such a conclusion is not necessary; that the difficulty here exploited rests upon a confusion. Because *objects* are timeless, it does not follow that their *value* is

⁹ "Studien zur Wertaxiomatik," Leipzig, 1914, p. 42, note.

timeless; because the truth about these objects can not be more or less true, it does not follow that these truths can not be more or less valuable.

Properly understood, then, it is true that it lies in the nature of all values to be comparable. It is not true that "all facts about non-existence are neither better nor worse." Though it may be disputed, it has meaning at least to say that the fact that two plus two equals four is more important than the fact that all the angles of a triangle are equal to two right angles; or, as Wundt somewhere in his *Ethics* maintains, the postulates of morality are *more important* than the axioms of logic. Perhaps there are points of view from which a circle may be said to be more valuable than a round square, and virtue more important than either. There are doubtless many such relations that are non-significant, but this non-significance does not affect the principle. If every object is actually or potentially somewhere in the sphere of value, positive or negative, and if the nature of value is such that, given any three values, one of them must be in the middle, all value objects of whatever sort must be ultimately commensurable. The fact of our inability to determine this order does not affect the principle any more than the fact that our knowledge does not enable us to determine the existence or non-existence of an object, affects that existence. While values are often empirically incommensurable, they can not be so in principle without destroying the essence of the value notion.

Of the significance of this principle we may speak more briefly. It may be said that this "*a priori* principle" is nothing more or less than the principle of degree or quantity inherent in quality as such; quantity is applicable to value as to any other aspect of things. But aside from the fact, already established, that value is not such a quality, such a claim would constitute a misunderstanding of the entire position, the very point at issue. In the case of quality and its degree, the two concepts are at least analytically separable. In the case of the value notion, on the other hand, this *a priori* character is part of the very notion itself. It is interesting in this connection to note that Baldwin in his theory of value, the most adequate in recent discussion,¹⁰ recognizes that mediation and relativity (the relation of more and less) are bound up with the value notion. For this reason he finds reality neither in the categories of existence nor in value, but in the esthetic. But is not the esthetic an experience of value? If not, what is it? And if it is a value, does it not presuppose another value, more or less? His contention that esthetic objects, as esthetic, are not comparable can scarcely be said to be made out (p. 282). The failure to recognize that more or less is inseparable from value ex-

¹⁰ J. M. Baldwin, "Genetic Theory of Reality," New York and London, 1915. See my review, this JOURNAL, Vol. XIII., p. 356.

perience even in its esthetic form, vitiates, I think, his entire argument.

II

I have now developed what seem to me to be two *a priori* elements in the value notion, elements that lie in the nature of value as such. I do not say that this exhausts the *a priori* aspect of value, but this will suffice for our present purposes.

The results of this study have, I think, their own intrinsic significance, but, as I have already suggested, they will be used here chiefly for the further development of the doctrine of the "value objective." Let us now return to the conclusions of the preceding paper. The essentials of that position are that value is not an object, physical or psychical, neither a quality of objects, nor a relation between objects of the type of the relational definitions. It is a unique objective. These conclusions were reached negatively by a critical examination of definitions of value, positively by an analysis of the processes of apprehension of value. In the present paper the method has been a more objective one, of *a priori* analysis. But the results are, I think, wholly complementary. Let us examine some of the more important points.

In the first place, the difference between value and any form of being becomes wholly clear. The value predicate, like the existential, is a universal category. As every object, *qua* object, must be either existent or non-existent, so every object must fall somewhere in the scale of positive or negative value. But the essential differences between the two are also clear. Whereas existence is the contradictory of non-existence, negative value is not the contradictory of positive value. This difference should constitute an effective barrier against identifying value with any form of being.¹¹ But the difference appears at another point also. There can be no such thing as an isolated value—the concept of higher and lower is inseparable from the value notion. There may, however, very well be isolated existents and truths. Value can not be thought without at the same time thinking degree, but the same is not true of being. When the opposite position is taken, for instance, in the theory of degrees of reality, it is, I believe, because a value connotation is read into the concepts of existence and being, and with this connotation is borrowed the essential form of value. But of this more later.

¹¹ On this aspect of the question, see also Rickert, "*op. cit.*", pp. 264–71, where "negation" is used as a criterion to distinguish value completely from being. Whether, as some think, this fact constitutes an equally effective barrier against conceiving existence and truth as values, against viewing the existential judgment as a value judgment, is yet to be considered. This view will receive full consideration in a later connection. Here we are concerned merely with one half of the problem—that value is not a form of being.

No less important is the light which this *a priori* analysis throws upon the positive character of the value objective. The verbal form of the value judgment is, as we have seen, that an object ought to be, or to be so and so, on its own account. In this judgment we apprehend, not a quality of objects, but an objective. Whence this "ought to be?" It springs, I think, from the *a priori* necessity inherent in value as such. That an object *must* have positive or negative value, that beyond the valued object is another object either more or less valuable, are propositions prior to and independent of any particular interest or feeling. It is in the last analysis a matter of immediate evidence. But if it lies in the nature of value as such that, given any two objects, one must be necessarily more valuable than another, then it follows that that one ought to be rather than the other. We can contemplate the opposite of this proposition no more than the opposite of the proposition that two plus two equals four. The point may be made clearer, perhaps, by saying that of no object by itself may it be said that it ought to be. It ought to be only *rather than* something else. It is impossible to think oughtness apart from more and less. An isolated value is a contradiction in terms.

It may, of course, be objected that part of our very characterization of the intrinsic value of an object is that it ought to be *on its own account*. But to make this objection is wholly to misunderstand the notion of intrinsic value. The expression, "on its own account," has reference to the relation of means to ends, of object to tendency, etc., not to that of more or less. The latter relativity is inseparable from the value notion. The relativity of value in this sense is in no way in contradiction with the statement that value is not a relation. Value, it is true, can not be adequately defined as a relation of an object to a subject or of object to tendency, etc., but the relation "better than" can be seen to lie in the nature of value as such.

My third point has to do with the much-disputed question of the "subjectivity or objectivity" of value. The chief point in the discussions of the Association, it was also one of the most important lines of cleavage in the debate that followed. On this point also I think our analysis throws some light.

Concerning an objectivity of a certain kind, there is, of course, no dispute. That there are values that do not come and go with the individual subject that feels them—for instance, economic and ethical—no one doubts. Of these "it is not fair to ask whether they are relative to human feeling or objectively 'real.'" They are both. When the social nature of valuation is considered the alternative between objectivity and relativity to human feeling is wholly unsound." Into this point I need not go here. It is fully developed in my study

of values.¹² But this is not the question at issue. It is concerning an objectivity of quite another kind about which the dispute rages.

There are those, for instance, who think that values are qualities of objects subsisting like squareness, that the subject merely apprehends them and that they subsist independent of any reference to a subject. It is not "sinnlos," for instance, to attribute to the gold of California "a value for the inhabitants" at a time when it was still undiscovered. It is not meaningless, certainly; but why is it not meaningless? Because we are not dealing with a valuation at all, but with a simple truth proposition.¹³ Again, there are those who, as we have seen, in their attempts to do justice to the nature of value as ultimately objective, and at the same time to recognize its relation to an emotional subject, characterize it as "imperative existence" or "being for will." That this but leads us back to the difficulties of the "relational definition" we have also seen; we need not go into this here.¹⁴

How then conceive the objectivity of values? No one really believes that value comes and goes with the subject that feels it; how reconcile this with the equally certain proposition that value is always *for* a subject? I, for one, am not disposed to minimize the difficulties of the problem. I have been reflecting upon it for years. Having tried all the hypotheses—of "potentialization" (Meinong) of "over-individual will" and "transcendental subject," and found them wanting, I am not overconfident of the solution here proposed. But I think the answer lies in the direction at least of the positions of this paper. Let us recall then the *a priori* aspects of value and see what bearing they have upon this point.

That there would be no valuation, and therefore no application of the *a priori* laws of value, if there were no emotional subject with his interests, can now be taken for certain. But this is far from saying that the value is wholly determined by the emotional subject, either individual or social. Part of the determination of any value is precisely the necessity that lies in the nature of value as such. I may perhaps put my point in this way. *If we know apart from particular experiences of desire and feeling, that every object, in*

¹² "Valuation, Its Nature and Laws," Chap. XIV., pp. 386-395. See also De Laguna, "Introduction to the Science of Ethics," p. 336.

¹³ To infer from this that value is independent of any subject is to fail to make an important distinction which it has been the special service of D. W. Fisher ("The Problem of the Value Judgment," *Philos. Rev.*, 1913, Vol. 22) recently to emphasize, the distinction, namely, between value and the relation of "value for a subject." The latter is a truth proposition, and like any other is timeless. The relation of value of gold to inhabitants was true then, as it is now, but the value as such was not, except indeed in the sense that potentially every object must find itself somewhere in the scale of positive or negative value.

¹⁴ "Value and Existence," pp. 464-65.

the broadest sense, has some place in the world of value, either positive or negative, then the psychological processes of valuation can not first give it that place. If it is true that given two values, they must necessarily stand in the relation of more and less, then the processes of feeling and will can not first create that relation. Recognition of the full weight of this argument should establish the objectivity of value in the more than social sense. It should also serve to show, I think, that this objectivity is not incompatible with the proposition that value is always for a subject, and with the subjectivity of the "value qualities." Further than this I do not at this point care to go.

III

In conclusion a few words are necessary on the much-disputed question of the "value-judgment." Some discussion seems required by the fact that it has been assumed throughout. In so far as it does not merely indicate a careless use of words, the claim for a specific value-judgment, as distinguished from judgments of existence and truth, implies that value is in some sense a counterpart of being, and our conception of value as an "objective" undoubtedly requires us to hold to the value-judgment. So far as they go, the arguments for the former are arguments for the latter. The conception of "knowledge of value" developed in this paper also distinctly implies it—especially the discussion of subjectivity and objectivity. In what follows we shall confine our efforts to meeting certain arguments against the value-judgment.

That this is a conception that has recently been losing rather than gaining ground, can not be denied. It is held by many that what is called a value-judgment is really a truth-judgment (Meinong, Somlo, Perry); that valuation itself is not judgmental, but the apprehension of a quality (Meinong) or the expression of a feeling (Croce, Perry). When I say that this ornament is beautiful or this act is good, all that I am saying is that it is true that the object has this quality, or calls out this feeling; or, on the relational view, I am merely cognizing a relation between the object and the interest of a subject. I can not avoid the impression that the negative view in all its forms rests upon a misapprehension of what the supposed value-judgment really is, the reason for which we may, I think, now see. That an object has such and such a quality, that the ornament is beautiful or the act good, is undoubtedly a truth-judgment, a statement of matter of fact. Similarly that *A* has interest for a subject is merely the cognition of a relation of the object to the subject. If either of *these* is the value-judgment, then, of course, it differs in no significant respect from judgments of truth and fact. Again, if the value-judgment is identified with the "emotional experience" of

the good, there seems reason for saying that we are merely calling judgmental what is not judgmental. It is as Croce says, merely "an expression of feeling"; all that distinguishes the value-judgment from the truth-judgment is found in the pre-judgmental level.

But is this really the case? Is the value-judgment to be identified with either of these—truth-judgment or feeling? Evidently in our opinion it is not. We have already warned against the confusion of the truth-judgment with the value-judgment. Similarly, we have repeatedly and specifically distinguished between the emotional experience of the value-qualities and the value-judgment,¹⁵ showing that while they may be simultaneous in experience they are always separable for analysis.

This misapprehension of the locus of the value-judgment comes out clearly in a recent discussion by Perry. He puts the supposed difficulties of the value-judgment theory in an especially cogent form (either truth-judgment or emotional experience) and calls upon the present writer to answer the dilemma which he presents. "The attitude of interest," he submits, "either constitutes values or it cognizes them. If it constitutes them then the cognition of value lies in the observation, comparison, recording, and systematic description of interests in their relation to their objects and to one another," that is, they are truth-judgments. "If, on the other hand, the interest cognizes values, then values themselves are not matters of interest at all, but qualities of objects for which interest furnishes simply the requisite sensibility. If we accept this alternative, we are thrown back upon Moore's contention that value is indefinable."¹⁶ He means here, of course, an indefinable quality.

Let us examine this supposed dilemma. "The attitude of interest either constitutes values or it cognizes them." The careful reader will have already scented the ambiguity in the word "values" which it has already been one of the main objects of our earlier study to remove. It may well be that Perry is sound in his doctrine of the subjectivity of the "tertiary qualities," although his illustrations we have found singularly inept,¹⁷ and in view of the still debatable question of an "emotional presentation," we prefer to leave the question open. Let us say then for the sake of the argument that the attitude of interest *constitutes* these qualities or "values." Does it follow that it constitutes the *value*, that relation of the object to being, described as "ought to be"? If, as I think we have abundantly shown, value is something other than the qualities on account of which the object is valued, then it may quite possibly be that these qualities are dependent upon desire and feeling and yet that part of

¹⁵ "Value and Existence," p. 42.

¹⁶ R. B. Perry, "The Definition of Value," this JOURNAL, Vol. XI, p. 152.

¹⁷ "Value and Existence," p. 457.

the value which is determined *a priori* be cognizable only by judgment. If, to repeat, we know apart from experiences of feeling and will that every object has some place in the world of value, and that given any two values they must necessarily stand in the relation of more and less, then valuation can not give it that place, and interest can not first create this relation.

The *disjunction* itself is then open to question. It is not certain that there is no middle ground, that the total attitude of "appreciation" may not include both "constitution" and "cognition." But let us see how the dilemma proceeds. If interest "constitutes values, then the cognition of value lies in the . . . systematic description of interests in their relation to objects and to one another." There can be no question that *such* cognition involves no specific value-judgment. As we have seen, it differs in no respect from judgments of truth and fact. But (and it is curious that Perry has not seen this) *it also involves no cognition, no acknowledgment of value at all!* That which the value-judgment gives me knowledge of, that which constitutes knowledge of value, is something quite different; it is that unique relation of the object to being and non-being, that an object ought to be, the value objective. To call *this* (systematic description of interests) cognition of value is simply to confuse acquaintance with an object with "knowledge about."

But it is even more, I think, in the second part of the dilemma that a serious misapprehension appears. "If, on the other hand, interest *cognizes* values, then values are not matters of interest at all, but qualities of objects for which interest furnishes simply the requisite sensibility." Here again the confusion of value and "values" plays its part; but more important is the assumption that *value must be either a relation or a quality*. But are these the only alternatives? Certainly not if our criticism of both these conceptions is sound, and the argument for the value objective is valid. Surely Perry does not confuse the qualities of an object apprehended by the senses with its existence as apprehended by the judgment. Why then should he confuse the qualities of an object on account of which it is valued with the value itself, the fact that it ought to be?

I think it will be clear to all who have followed our argument thus far, that whatever apparent force this dilemma has is due to ambiguities in the terms "cognition" and "values." Values, being determined by interest, the cognition of value, we are told, can be nothing but the "observation, comparison, and systematic description of interests in their relation to their objects and to one another." Now if by "cognition" of values is here meant what I have called the science of values, I have no objection to make. My own work which aims to be a contribution to such a science, is just such a sys-

tematic description. But if, on the other hand, cognition of value does not mean in the least that description of relations—value being not ultimately definable as a relation—then the cognition of value can not be such a description. That which lies in the nature of value as such is forever different from that which lies in the nature of existence and truth. The term appreciation simply marks this difference.

But all this has to do with questions that arise from a sheer misapprehension of the problem of the value-judgment. Much more important, to my mind, are Croce's strictures, already noted, when their implications are fully understood. They go to the root of the relations of value to being, and for this reason are especially significant from the point of view of our discussions of the relation of value to reality yet to come. For him, as we have seen, the so-called value-judgment is simply an absurdity, a logical monstrosity; and what are called value-judgments should be recognized as merely "expressions of feeling." "Take," he says, "the value-judgment in its usual form, 'A is as it should be,' or negatively, 'A is as it should not be.' Apparently it is a judgment, because it seems to assure us by implication of the existence of a specific A. That an existential judgment is presupposed in so-called value-judgments is beyond doubt, but one must not confuse the conditions with the conditioned." With this premise, he proceeds to disclose the logical monster. It is best seen in the negative form. For "if A exists, it is already as it should be, for it can not be otherwise." But the positive form is no better. "A is as it should be." If this form escapes contradiction it falls into tautology, for if A is it is already as it should be.

The point of the criticism seems clear enough. Finding, as he rightly does, the true locus of the supposed value-judgment (intrinsic value) in the proposition that an object ought to be or ought not to be, he seeks to show that a judgment *of that form* is impossible. In order to do so, however, he must make certain assumptions which are certainly open to question. The first of these is the assumption that value is a quality, and with it the assumption that the value-judgment, to be a judgment, must be of the type, *S is P*. Now, as we have seen,¹⁸ contradiction certainly does result if value be conceived as a quality, if oughtness is the predicate in such a judgment. Qualities inhere in objects, and since it is the quality that makes the object what it is, the judgment presupposes that the object is not other than it is. Make value equivalent to "ought to be" and call this oughtness a quality of being, and the logical monster is complete. But we have also every reason to believe that value is not a quality. Moreover, there is no reason for assuming that the value-

¹⁸ "Value and Existence," p. 459.

judgment must be of the type *S* is *P*. In fact, I think that while Croce has found the true locus of the value-judgment, he has mistaken the form, and his difficulty really goes back to this. The value-judgment is not "*A* is as it ought to be," but rather "that *A* ought to be." It is the very nature of the value-judgment that it apprehends, not something completely given, but rather something to be. Value is not a determination of being, but a direction of becoming.¹⁹ The second unwarranted assumption is that the value-judgment "assures us by implication of the existence of a given *A*." "But if *A* exists, it is already as it should be, etc." This assumption is, as we have already seen, wholly unwarranted. The value-judgment does not give us knowledge of existence. Existence is not a necessary presupposition of value. With the recognition of this fact another source of the contradiction and absurdity disappears.

It can not, of course, escape the thoughtful reader that the supposed difficulty which Croce here exploits really raises the fundamental metaphysical problem of value and being. For an idealism such as he professes, value and being are ultimately identical; "*A* is already as it should be," whatever is is right. To say that an object ought or ought not to be must then be but a subjective "expression of feeling." Now that value and reality are ultimately inseparable seems to be an ineradicable postulate of our thought. As we find reality intolerable without raising it to the sphere of value, so we find it equally difficult to think value without giving it some form of being. This sets the ultimate—and most difficult—of the ontological problems of value; it will engage our attention in the paper still to follow. But one thing at least is clear. There is no justification whatever for the dogmatism that Croce here maintains, and still less for its use as an argument against the value-judgment. The difficulties in the way of conceiving value as a quality or "determination" of being are now fully apparent; and if this misconception of value be removed, the more serious difficulties of the value-judgment disappear.

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THE CONFESSIONS OF AN OLD REALIST

IT would be difficult to say whether the "common sense" views of the "plain man" are regarded by contemporary philosophy chiefly as objects of reproach or as ideals for emulation. Numerous

¹⁹ I can not claim to have completely understood Professor Dewey's very suggestive paper on the "Logic of Judgments of Practice," this JOURNAL, Vol. XII., p. 505, but I think we are in agreement on this point.

citations from representative thinkers might be given to substantiate either view. But it is interesting to note that, however the "plain man's" views are evaluated, the old dualistic realism is both ridiculed as mere unsophisticated common sense and at the same time attacked as over-sophisticated epistemology. The defender of the old realism, therefore, finds himself in a most uncomfortable position. To be both unsophisticated and over-sophisticated at once is to have a complication of diseases which is, to say the least, unpleasant. And his discomfort is increased by the very nature of his old-fashioned views. For they are so very commonplace and uninteresting. In face of the bewildering variety of innumerable idealisms and new realisms which overflow the philosophical market, he can but feel somewhat shy of exhibiting his very modest and time-worn wares, and half ashamed of being found still in possession of his antiquated heritage. His only comfort is the thought that heirlooms so aged as his, though worn and rusty, at least show a certain time-defying quality which none of his neighbors' fresh and shiny articles gives evidence of possessing.

What the dualistic realist stands for is pretty well known to all; yet it is, perhaps, worth his while to make from time to time a fresh confession of his faith and of its bearings upon the new problems and the new theories of the age. He maintains, as he ever has done, that the antithesis between the mental and the physical is the most absolute antithesis within the realm of being, and he regards all attempts to minimize its importance as bound to lead to confusion of thought. He is not, however, so belated in his thinking as to fail to realize the difficulties that beset him the moment he attempts to define these two spheres of being. If he starts out to give a positive definition of consciousness he finds himself in danger of taking for granted the thing to be defined and of describing it by a series of its synonyms. For consciousness, as he understands it, is *sui generis*, or at any rate belongs to no other genus than the very abstract one of being. And if he is to define it by its differentia from other species of the genus being he seems reduced to purely negative terms. This difficulty, indeed, is one that he himself is the first to declare; repeatedly he has asserted that no definition could make plain the nature of consciousness to one who did not already know by direct experience what it was, any more than a form of words could communicate to a blind man the real nature of red. This predicament is undeniably an unpleasant one, and the opponents of the old realist have not failed to take advantage of it, reviling him for his speechlessness and asking the seemingly pertinent question, If you are so sure of "consciousness," do tell us what it is! To which our old realist can only respond that the question is really not so pertinent as it seems, since con-

consciousness, if it be what he considers it, must by its very nature be incapable of the sort of definition that the question seems to demand.

Under these circumstances the best course for our old realist would seem to be to start, not with a definition, but with what logicians call an exhibition of terms. He may, in other words, begin by pointing out certain entities the existence of which no one denies, as the representatives of the field which the word consciousness denotes. If he is to pursue this method he should, of course, be especially careful to include among his terms nothing whose existence is subject to any serious and sensible doubt. Hence it would be decidedly inadvisable—at least in my opinion—for him to stake his cause on so very dubious an entity as “consciousness in general.” If there be such a thing as consciousness in this sense—a sort of diaphanous varnish through which we see everything else—it is at least very difficult to prove it, and even though it were demonstrable by inference it could not be classed as one of the empirically obvious entities which we could exhibit in an attempt to show what we mean by the psychical. Neither do I think the dualist should include the self in his exhibition of mental entities. I have been much impressed with Miss Calkins’s arguments in favor of the self, but whatever one’s views of its nature and reality, it can hardly be put forward as an admitted and directly experienced entity which will serve to make more clear the meaning of consciousness.

Among the entities which I think the dualistic realist should exhibit as illustrations of the mental should be included conations, affections, meanings—all of which have a certain active character which makes them peculiarly “subjective”—and also the more objective items of consciousness, namely, sense qualities, whether primary or secondary, percepts both veridical and non-veridical, and memory or imagination images. Since nearly all the new realists, whether American or English, agree that these latter, relatively passive, entities belong to the physical world, and since they involve certain peculiar difficulties, it may be worth while to give special consideration to the question how the dualist should deal with them. Professor Holt has pointed out most admirably the difficulties and absurdities involved in the fairly common view that sensations have no qualities. “The clover is not yellow: *that* is merely my sensation. Yet mine is not a yellow sensation. Oh no, as Berkeley and all [?] psychologists firmly agree; the sensation is neither yellow nor red, loud nor soft. Where, then, is the yellow, if the object is not yellow nor yet the sensation yellow?”¹

Professor Holt’s criticism is not only admirably expressed, but it is so unanswerable in itself that I for one should be induced to

¹ “The Concept of Consciousness,” p. 139.

recommend to the dualist an immediate surrender if I thought him bound to uphold the view of consciousness which Professor Holt attacks. The criticism is too profound to be answered; it must be avoided. For my own part I must add that long before reading Professor Holt's and Professor Woodbridge's² criticisms of the dualistic view of consciousness I had come to the conclusion that sensations and percepts, as psychical entities, must be regarded as having actually all the qualities which we find them to have—color, extension, and the rest. That this is the rational and natural course seems plain enough as soon as it is suggested, and so far as I can see there is no good argument against it. At first, no doubt, it seems paradoxical to speak of a *green sensation*, for the phrase suggests picking up an object, looking at it, and finding it green. And if in saying that we had green sensations and percepts one meant that we looked *at* our percepts and found them green, it would of course be both paradoxical and absurd. We do not *look at* our percepts. Neither have we got green percepts inside our heads. We open our eyes and see green trees and green grass; and our consciousness at that moment has, as one of many characteristics, that of greenness. We do not see our percepts, but we see by means of them. To have visual percepts is to see. To have green percepts is to see green.

In like manner our percepts or images are characterized, not only by all the secondary qualities, but by all the primary qualities. They are spatial and temporal in just the same way that they are green and sweet. And here we come upon a point of the dualist's creed which, I confess, does at first sound paradoxical. I shall state the paradox as startlingly as I can. Our visual and tactual percepts *are spatial, but are not in space*. Unquestionably extension is one of their characteristics, but this does not mean that they belong to or have position in the common objective space which science studies; it does not mean that any one of them can be said to be six inches long or any other ten feet high. To ask, *How much* extension has your perceptual image? How many feet or inches does it extend? is to treat a percept as something which it is not. When I say that a physical object is a foot long I mean that it is the same length as another physical object in objective space, namely, a foot rule. When I say that a perceptual image has spatial qualities I do not mean that it can be measured by a foot rule. My image of a tree, let us say, is not so long as my image of a foot rule when I hold the rule close to my eye: it is longer than my image of the rule when the rule is leaning against the tree trunk; but in both these cases I am measuring image by image and neither of them by the foot rule.

Hence I maintain that there is nothing illogical or difficult in the

² "The Belief in Sensations." This JOURNAL, Vol. X., pp. 599 ff.

conception that percepts have spatial characteristics, but are not in space. The proof that they are not in space is of course another matter, and in this brief paper no attempt is made to prove the truth of any of the conceptions of dualism, further than to show that they are not inherently contradictory or illogical. And that much I think I may fairly claim for the view I have stated about perception and space. Take the objective space which new realists and old realists alike believe in, the space studied by geometry and presupposed by the natural sciences; go through it carefully, examining all its contents; rake it, dissect it, go over it from east to west with the finest of fine-tooth combs, with the most powerful of microscopes and the most sweeping of telescopes; and nowhere in it shall you find a perception or any other item of consciousness. Space is chock-full of other things. There is no room in it for consciousness. And consciousness is by its nature such that it can not be in space. It is a different sort of thing. The physical objects which we perceive and think of by means of our percepts and images are in space; the brain processes which are somehow connected with the percepts and images are in space; but the conscious entities themselves can no more be *in space* than a logarithm can be in a quart of milk.

Having tried to show what "consciousness" signifies by pointing out its denotation, our old realist may now, more profitably than at first, attempt a (negative) definition of it. This he can best do by first indicating what he means by *physical*. And I know of no way by which a realist of any type, whether old or new, can state the nature of the physical without falling into the traps laid for him by the idealist except by presupposing the independent reality of an objective space. With this premised, he may very well define the physical in the way proposed by Professor Stout in the "Proceedings of the Aristotelian Society,"³ or in the very similar way suggested in an article in this JOURNAL.⁴ The physical might, then, be defined as that which has extension or position within our common, objective, three-dimensional space. I am not certain that more need here be added, though I am quite ready to modify my view. But even if this should prove an adequate definition of the physical, we could not shortly define the psychical by merely calling it the non-physical. For if we would avoid a view which one enthusiast over the new logic, with a shudder at the thought, entitles "impious," we must at least leave a possible place for purely logical entities. The old realist might, indeed, perfectly well contend that these are only thoughts or possible thoughts, but he need not take this view, hence had best formulate his definition of the psychical in terms which shall not

³ "Are Presentations Mental or Physical?" in the "Proceedings" for 1908-09, p. 226.

⁴ Vol. XIII., p. 578, note.

force the lovers of the new logic into the ranks of his enemies. He has enemies enough without them. With these considerations in mind, the psychical might be defined as those non-physical entities which (in the words suggested by the executive committee) "are existent only as functions of the experience of one or more individual persons or organisms."

The question how the old realist is to prove the truth of his views is one which obviously can not be treated in a brief paper whose single aim is to formulate those views. I can not, however, regard those views as even formulated without saying something about that bitterly attacked and (as I think) often misrepresented correlate of dualism, the "correspondence theory of knowledge." That dualism, with its correspondence or "picture" theory, is in some respects an improvement over naïve realism, its opponents are usually willing to grant. "The great advantage of the picture theory," say the Platform Realists, "is that it fully accounts for error and illusion; the disadvantage of it is that it appears to account for nothing else. The only external world is one that we can never experience; the only world that we can have any experience of is the internal world of the ideas."⁵ We are, in short, imprisoned within the iron ring of our ideas and are prevented by them from ever getting at reality. We can not know the real because our ideas are between us and it, blind-folding our eyes and stopping our ears.

This, it must be admitted, seems to be a very serious criticism; serious both because of the consequences to which it leads and because it contradicts what appear to be plain facts. When I perceive a house I surely do not perceive my percept of the house; when I think of my friend I am thinking of *him*, not of my thought of him. The "man in the street" who, after so many years of ignominy, has come into such great and sudden favor with philosophers, will tell us that he sees things and thinks of things "*directly*." Before condemning the correspondence theory, however, let us ask ourselves what it is to perceive a thing directly. Few certainly will deny that we perceive by means of our sense organs. And though the man in the street may know nothing about it, most of the rest of us will admit that our nervous system has something to do with perception. In perception, therefore,—in "direct perception" if you like—we make use of our sense organs and our nervous systems, and without them perception would be impossible. Now, as I understand the dualist, he maintains merely that in perception we use not only our sense organs and nervous systems, but also our perceptual images, and that if any one of these means or implements were lacking perception would be impossible. My perceptual image is one of the tools I use in perceiving my

⁵ "The New Realism," pp. 4-5.

object, and to have it is to perceive my object and to perceive it directly. In having a perceptual image I do not perceive a perceptual image: I perceive the object, and I do so by means of the image. In like manner, in thinking of my friend I do not think of the thought of my friend; but I have a thought of him, a thought which means him and which (in both an intellectualistic and a pragmatic sense) corresponds to him. If the critic insists this is not direct knowledge will he tell us what direct knowledge is? What does the gentleman want? To say that my friend is the direct object of my thought and to say that I think of him directly seem to me identical assertions. Percepts are simply my means of perceiving and thoughts my means of thinking, just as the voice is my means of speaking. To insist that I can not perceive a red house because I have to perceive it by means of my percept is like insisting that I can not hear the organ because I can only hear its sound, or that I can not say "Boo" because I have to say it with my voice. The correspondence theory, therefore, properly understood, far from making of our ideas a prison house, considers them a part of the necessary means of external reference and communication. And the criticism upon it, which at first seemed so serious, turns out to be in fact a demand that we should think without thoughts and perceive without perceptions.

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REVIEWS AND ABSTRACTS OF LITERATURE

The Moral Obligation to be Intelligent, and other Essays. JOHN ERSKINE.
New York: Duffield and Company. 1915. Pp. 167.

It is a small book on a great subject, a book of philosophy in the ancient and honorable sense, for it is a little book of unlabored wisdom discussing not God's business but man's.

The education of the imagination is a great matter, and literature is a school for the training of it. What are the virtues that English literature invites us to admire? And what would Socrates be likely to say about the Victorian, pre-Victorian, and post-Victorian ideals? Would he find his favorite virtue, the only one he put much store by, esteemed or understood? The men who went down with the *Royal George* died bravely, but they were the victims of stupidity, "and our memory passes easily over the lack of a virtue we never did think much of, and dwells on the English virtues of courage and discipline. So we forget the shocking blunder of the charge of the Light Brigade, and proudly sing the heroism of the victims." Mathew Arnold explained the purpose of culture as the purpose "'to make reason and the will of God prevail.' This formula he quoted from an Englishman. Differently stated, the purpose of culture, he said, is 'to make an intelligent being yet more intelligent.' This

formula he borrowed from a Frenchman." When the *Titanic* went down, hundreds died in the fine English way, but with no necessity and no excuse. The fact that this was the English way of doing things was the heart of the tragedy, as a man pointed out. "That discouraging person was an Irishman." "What would Socrates have thought of Mr. Pickwick or the Vicar of Wakefield, or David Copperfield or Arthur Pendennis? For that matter would he have felt admiration or pity for Colonel Newcome?"

But hope appears in a quarter where it has been least expected by those bred up on the English classics. To our shores come hosts of human beings bent on escaping from one thing and possessing another, on finding opportunity for the exercise of intelligence in bettering their lot. "They differ from each other, but against the Anglo-Saxon they are confederated in a Greek love of knowledge, in a Greek assurance that sin and misery are the fruit of ignorance, and that to know is to achieve virtue."

With which ideal ought education to be inspired? Shall we give the English or the French definition of culture. To America, at least "much as we may sentimentally deplore it, England seems destined to be less and less the source of culture, of religion and learning." When a professor of English writes like that, philosophers ought to know about it. Philosophy is singularly exposed to the temptation to be doing the will of God; it can surely do no harm to accustom ourselves to viewing philosophy as a contribution to intelligence.

The second essay is an imaginary commencement address, and is an altogether delightful blend of seriousness and humor. I can not resist the temptation to quote the opening paragraph and part of the second.

"As I feel for a moment the wholesome dizziness that is the penalty of mounting a platform above one's fellows, and as I look down at the young faces courteously lifted for my first words, I am aware of—what shall I call it?—of an enforced collaboration; suddenly I have a vision of other rooms filled with other young men, who wait, as you do, for the first words of the commencement speaker, and at once I feel a sudden sympathy with those other speakers, who desire, as I do, to translate the occasion into wise and appropriate words. I see our various schools and colleges keeping their commencements with a single mind—the audiences all expecting the same address, and the speakers, however original, all delivering it. You expect, every graduating class expects, to be told what to do with education, now you have it; your school or college owes it to itself, you think, to confess in public the purpose for which it has trained you. I can almost hear the speakers, from ocean to ocean, responding in unison to this expectation in the graduates they face; the simultaneous eloquence is so inevitable that I can follow it almost word for word; in fact I almost join in.

"The speech they are delivering is known as the Call to Service. The substance of it is that educated men should be unselfish; that learning is a vain and dangerous luxury if it is only for ourselves; that the following of truth, the reverent touching of the hem of her garment, is not, as we may have thought, a privilege, nor is even the love of truth a virtue, until

it is converted into a responsibility toward others. Few of us care to challenge this teaching."

Mr. Erskine almost joins in, but not quite; for the call to service is so gladly heard by young idealists: and it pardons one's own shortcomings so generously, and it is so generously indifferent to any reluctance or hesitation on the part of those in need. "What confounds us is the plain fact that only those who hope to render the service have the slightest enthusiasm for it." Who is to be really benefited? And enthusiasm for the call is not enough. Missionaries are warned, I believe, against enthusiasm. If enthusiasm is not felt for the means as well as for the end, for the capacity to serve as well as for service itself, we are likely to go on in the good old way of being satisfied with good intentions.

"The Mind of Shakespere" is a subject of a different sort, yet a discerning reader may see in it a contribution to the theme of intelligence from a different angle. Shakespere has been explained with adoration as a miracle that ought, by his very distance from us common folk, to be unintelligible. But we understand him as though he were one of ourselves. He does not say what no one ever thought of before, but what every one instantly comprehends. It is his unembarrassed penetration that seems so marvelous; he sees life and things, not a social version of life and things, and he uses words as life and things call for them, not as custom calls for them. In this he is like vigorous children, or those rare grown persons who are so full of light because they are so unconsciously, so recklessly sincere. His wisdom is not of the sort that comes from pondering upon problems, and weighing alternative solutions; it is the sudden insight into particular rights and wrongs which, though expressed in general terms, is a reaction to concrete realities. That is, after all, the vitality of intelligence, though Mr. Erskine does not precisely say so.

With the last essay, "Magic and Wonder in Literature," we are again facing the problem of intelligence. Magic has had a great career in the world, and in literature it survives in the stout British faith that goodness is a working substitute for knowledge. A few centuries ago beauty could work miracles, but to-day we are fed abundantly with the doctrine that good intentions shall certainly prevail. Magic fascinated the mind because magic meant power, power to make something better for somebody, and this aspiration of magic is as natural and as human as any that we have. Why should the right way to get power be less wonderful than the wrong way? What literature ought to keep alive is the habit of wonder, that sense that things are as new to-day as they ever were, and that old age is only the working hypothesis of the undertaker. The trouble is, Mr. Erskine says, that "the ideal of wonder has rarely included the ideal of control, without which we refuse to be fascinated." Must this ideal permanently find expression in intellectual foolishness? Surely it is a serious matter that an instinctive apprehension of intelligence should pervade a literature and impregnate the imagination of its lovers.

One is reminded of much in Mr. Santayana's doctrine of poetry. And, indeed, back of these four essays is the philosophical attitude of "the

Life of Reason," which is a thing that literature ought to facilitate and not encumber.

WENDELL T. BUSH.

COLUMBIA UNIVERSITY.

What is Education? ERNEST CARROLL MOORE. New York: Ginn and Company. 1915. Pp. 350.

Professor Moore's book consists of a collection of eleven lectures and essays closely related to the question of teaching efficiency as based on the learning process in pupils. The author considers the chief enemy of a truly educative school-setting to be job-lot instruction of children (even including the children of a larger growth to be found in colleges and universities) by means of formal memoriter methods. Lectures or the more informal telling of the grades, are admissible against a background of inquiry, and book assignments are valuable, even essential, as means of solving problems already formulated in the pupil's mind; but lectures and book assignments are bad, and relatively worse, according to the passivity and lack of initiative of the learner. For learning, as a natural human activity is, and must be, world-building. If the pupil is to be educated, it is essential first of all that he be an active builder. To be a builder, it is fundamental that he should possess aims—not aims in general, but aims specific, local, present, self-discovered, and self-chosen. "Methods of teaching are good just in the degree that they make the student a partner in the enterprise of learning." The first aim of the teacher should be to surround the pupil with conditions which will involve him profoundly in the processes of distinguishing, selecting, arranging, solving, and using.

The author's enthusiasm and single-mindedness of purpose combine with excellent literary qualities to produce a most readable and convincing book. Its subject-matter is not novel to one who has kept up with the literature of teaching method, as Professor Moore is the first to insist; but it is presented with a freshness and a breadth of historical vision that make it a very significant contemporary treatment of a theme that will never cease to demand attention.

Holding as he does a brief for the pupil's self-activity, the author does not stress as much as the topic deserves the place of drill and book-work in the class-room and the study period; but had he done so, the book would probably have failed somewhat of the larger usefulness that it bids fair to attain, for its greatest mission is pointedly and persistently to raise the troublesome question of how to assist children to mental self-activity and the possession of abiding interests of the right sort. A thorough, unbiased reading of the book can hardly fail of compelling the teacher, whether in the lower grades of the common schools or in the colleges and universities of the country, to ask himself whether he is doing all that he could do under the circumstances which surround him, in the way of introducing initiative, research, and judgment into the work of the pupils under his direction.

EDWARD H. REISNER

KANSAS STATE AGRICULTURAL COLLEGE

Contributions to the Founding of the Theory of Transfinite Numbers.

GEORG CANTOR. Translated and provided with an introduction and notes by Philip E. B. Jourdain. Chicago and London: The Open Court Publishing Company. 1915. Pp. vii + 211.

This volume is the first of a series of scientific and philosophic classics which it is the laudable intention of the Open Court Company to publish. The initial term of the series is excellent. The introduction tracing certain developments in modern mathematical analysis from impulses found in the mathematico-physical works of Fourier to their present culminations will not, indeed, be intelligible to many philosophers, but it will be interesting and instructive to many mathematicians. Mr. Jourdain has, however, rendered a service to many philosophers and to some mathematicians, by translating into clear and otherwise acceptable English Cantor's two epoch-making memoirs of 1895 and 1897. Cantor is by common consent easily primate among those who have contributed to the beautiful and, for philosophy and mathematics, the profoundly significant doctrine variously known in English as the theory of point-sets or manifolds or assemblages or aggregates or classes, in French as *Théorie des ensembles*, and in German as *Mengenlehre* or *Mannigfaltigkeitslehre*. And in the two memoirs here translated into English we have Cantor's maturest thought respecting the nature of those numbers which, as they surpass any finite number, however large, have been quite fittingly and even poetically described as transfinite. Here is not the place to analyze the memoirs themselves. It is proper to say, however, that they carry a certain atmosphere that may repel or embarrass a reader not familiar with the kind of thinking involved. The needed preparation may be gained by the help of Volume II. of "*Acta Mathematica*" where is found in French a collection of the earlier contributions by Cantor to the general theory of manifolds. It ought also to be said here that to any one without a knowledge of this general theory many of the most important recent developments in geometry and analysis are entirely inaccessible. When will those who guide advanced students of philosophy make them understand that unless they acquire a genuine knowledge of the mathematical science of manifolds the profoundest philosophic thought of our day must remain unintelligible to them and that they will be doomed to the indignity of having to choose between silence in relation thereto and allusion to it in vague and meaningless phrases?

CASSIUS J. KEYSER.

COLUMBIA UNIVERSITY.

Studies Introductory to a Theory of Education. E. T. CAMPAGNAC. Cambridge: University Press. 1915. Pp. 130.

This little volume contains what its author modestly claims for it, "short and fragmentary studies, parts of a long series of lectures given to students who propose to enter what is called the profession of teaching." There is an atmosphere of leisurely reflection pervading the book which reminds the reader of the Platonic dialogues. The subject-matter, too, is

reminiscent of classical training, and to one who is familiar with Plato's treatment of the relation of the individual to the state presents little that is new or original. The studies are eight in number, as follows: "The Meaning of Ideals for Society and for the Individual"; "Progress and Repose"; "Survey of Certain Ideals"; "Organization for the Achievement of the Ideal"; "The Aim and Province of Education"; "Education and Schools—The Code"; "The Freedom of the Pupil"; "The Business of the Teacher."

There is little unity of purpose apparent in connecting these essays with each other, but the idea which appears most frequently is the one emphasized in the fifth study, *viz.*, that thought is cooperative, a process of give-and-take between individuals. Education then becomes "a process by which man learns to maintain conversation with the world in which he lives." The business of teachers becomes "the imparting of ourselves to other people—a fusion of minds." The author discusses the relation of this ideal to the Elementary Schools Code of 1903, which proclaimed a social ideal in education and demanded a "partnership between teachers and pupils" as a means of realizing that ideal.

ALMA ROSA THORNE.

SMITH COLLEGE.

JOURNALS AND NEW BOOKS

JOURNAL OF ABNORMAL PSYCHOLOGY. August–September, 1916. *On the Irrelevancy of Dreams* (pp. 143–171): LYDIARD H. HORTON. —Bergson attributes the commonly noted failure of appropriateness in dreaming thoughts to the dreamer's lack of sufficient effort or energy for summoning the correct mental associations; Freud emphasizes the presence of a positive influence, a censor, who takes the blame for the droll disguises of meaning in dreams. "The physiological idea of 'facilitation' and 'reinforcement' acquires fruitfulness if we regard the dreamer as mal-apperceiving the stimulus, not alone because he is under-prepared in the domain of the correct constellation of memories, but also as subliminally pre-stimulated and over-prepared in the direction of the irrelevant response." The author presents a "Pantry Cupboard Dream" as an illustration which emphasizes the non-essential character of "effort" in connection with apperceiving a stimulus, in a relaxed condition of the organism. *On the Utilization of Psycho-analytic Principles in the Study of Neuroses* (pp. 172–177): JAMES J. PUTNAM. —The author attempts further to formulate the relationships between mental and physiological processes on lines analogous to those of Dr. Kempf. "The best attitude in which to approach the study either of ordinary neurological processes, or of the phenomena which characterize the psycho-neuroses studied by the psycho-analyst, is on the basis of a familiarity with a background of normality, obtained through a study of human beings at their best." *Permutations within the Sphere of Consciousness or the Factor of Repression and Its Influence upon Education* (pp. 178–188): TRIGANT BURROW. —Teaching is no longer a process of "leading out," but rather

a process of "pushing in." The author concludes that the need of the child is an educational programme which affords the release of his native interests—the freedom of his individuality through a progressive discharge of effects. He needs to *feel* and to *do* something. Educators should realize that methods of training which obstruct the free expression of the imagination in childhood are responsible for the vicarious development of those distorted, abnormal, anti-social manifestations of instinct existing in adult social life, and for those repressed and thwarted conditions of the more sensitive mind characterizing what is perhaps the most acute expression of human suffering. *On Descriptive Analysis of Manifest Delusions from the Subject's Point of View* (pp. 189–202): E. E. SOUTHARD.—"The writer aims at a descriptive analysis of manifest delusions and false beliefs taken subjectively. . . . An account is given of the comparative method by which these items of psychiatric analysis were obtained." *Abstracts. Reviews.* A. E. MAEDER, *The Dream Problem* (Translation): L. H. MORTON PRINCE, *The Psychology of the Kaiser*: MEYER SOLOMON. GEORGE W. CRILE, *Man—An Adaptive Mechanism*: HERMANN L. BLUMGART. E. L. MASTERS, *Spoon River Anthology*: MEYER SOLOMON.

Adams, Henry Foster. *Advertising and Its Mental Laws*. New York: The Macmillan Company. 1916. Pp. xi + 333. \$1.50.

Husik, Isaac. *A History of Medieval Jewish Philosophy*. New York: The Macmillan Company. 1916. Pp. 1 + 462. \$3.00.

Langfeld, Herbert Sidney and Allport, Floyd Henry. *An Elementary Laboratory Course in Psychology*. Boston, New York, and Chicago: Houghton Mifflin Company. 1916. Pp. ix + 147. \$1.75.

Santayana, G. *Egotism in German Philosophy*. London and Toronto: J. M. Dent and Sons, Limited; New York: Charles Scribner's Sons. 1916. Pp. 171. 5s.

Washburn, Margaret Floy. *Movement and Mental Imagery*. The Vassar Semi-Centennial Series. Boston: Houghton Mifflin Company. 1916. Pp. xv + 252. \$1.75.

NOTES AND NEWS

THE sixteenth annual meeting of the American Philosophical Association will be held in New York City on December 27, 28, and 29, in acceptance of the invitations of the American Association for the Advancement of Science and of the Department of Philosophy of Columbia University. The session will begin on Wednesday morning, December 27, and will probably continue until Friday noon, December 29. As announced in the first October number of this JOURNAL, there will be a prearranged discussion between chosen leaders. The formulated question and its bibliography will be found in this same number of the JOURNAL. There will be opportunity also for a number of miscellaneous papers. Members who wish to

present these are requested to send titles and abstracts (about 400 words) to the secretary not later than December 8. Papers are limited to twenty minutes in reading. In making up the programme all titles and abstracts are submitted to the Executive Committee for its examination and approval. The American Psychological Association celebrates its twenty-fifth anniversary during its annual meeting in New York this year, and invites members of the Philosophical Association especially to attend the session of Thursday afternoon, December 28, when papers will be read on the development of psychology in America.

AN interesting side-light upon both Thomas Carlyle and the history of philosophy in America (at least as it might have been) is found in the recent biography of Hutchison Stirling. In 1868, the latter, having been invited by Professor Francis Bowen to become his colleague in metaphysics at Harvard University, asked advice of Carlyle. In his reply, Carlyle, while satirical with regard to the just prior rejection of Stirling's candidacy by the University of Edinburgh, and while speaking highly of the intellectual atmosphere of Harvard in general and of Emerson's influence in particular, virtually recommended him to decline on the ground that America was an "Infinitely Anarchic Realm." Two years later Stirling also declined, on his own account, an invitation to give some lectures at Harvard University in connection with a series at Lowell Institute.

THE Section of Anthropology and Psychology of the New York Academy of Sciences met in conjunction with the American Ethnological Society at Columbia University on November 27. The following papers were read: "Echolalia in Idiots: Its Meaning for Modern Theories of Imitation," Dr. L. S. Hollingworth; "Shrinking of Visual Images," Dr. G. C. Myers; "A Comparison of the Binet-Simon Tests of Intelligence and the Squire Graded Mental Tests," Professor J. C. Bell; "Psychological Analogy in Political Theory," Professor J. P. Turner.

PROFESSOR BIRD T. BALDWIN, of Swarthmore College, has been appointed lecturer in education at the Johns Hopkins University. He is giving on Saturdays a course on "Educational Measurements," continuing the special work he began in the University's summer session.

DR. NORBERT WIENER (Ph.D., Harvard) has been appointed instructor in mathematics for the current year at the University of Maine.

THE next number of the JOURNAL will be a double number devoted to Charles Sanders Peirce and his works.

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PSYCHOLOGY

AND

SCIENTIFIC METHODS

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THE JOURNAL OF PHILOSOPHY

PSYCHOLOGY AND SCIENTIFIC METHODS

CHARLES SANDERS PEIRCE

PEIRCE AS A PHILOSOPHER

CHARLES S. PEIRCE called himself, in his later years, simply a logician. That he was a philosopher he fully recognized. But the term logician seemed to him more apt for a person engaged in the researches to which he was most devoted. For Peirce, rightly, logic would constitute the best possible foundation for a sound philosophy. But most philosophers, as he very correctly saw, were not logicians and would not be likely to become such until some very great reform occurred. Peirce united very wide knowledge of the history of philosophy with a generally fair-minded disposition to a discriminating criticism of philosophers, and with a capricious, though generally very well restrained interest in philosophical polemic, whose arts he regarded with a general skepticism and pursued with a usual moderation. But all the more he felt that the name logician stood rather for what the philosopher ought to be than the name philosopher for what a well-trained logician was most likely to be. So it was as logician that he wanted to be judged.

Nevertheless he was a philosopher. Like a good many other recent philosophers, he desired his philosophy to be what is so often called scientific. He desired that the methods of the various natural sciences, and in particular of the most exact natural sciences, such as physics and chemistry, should be the models of his philosophical speculations. He had a better right to use the term scientific philosopher than is customarily the possession of those who use this term. His early training here in Cambridge, in his father's house and in the Lawrence Scientific School, was, first, in mathematics (since his father, Professor Benjamin Peirce, the elder, was one of the greatest American mathematicians). Peirce was fond of saying that he grew up in a laboratory. Later, he did some good work in the observatory. Still later, he was busy with the conduct of a good many statistical researches in connection with the Coast Survey. He was early and long familiar with exact measurement, and with the

theory and practise of the determination of the errors of measurement in the measuring sciences. So, when he spoke of being a scientific philosopher, he was not without a really close knowledge of what scientific method in philosophy ought to mean. That in addition he did not fail to appreciate some at least of the great historical thinkers was due to his wide, manifold, and in some respects, very thorough erudition—an erudition that remained, like many other of his personal possessions, somewhat capricious, despite its frequent thoroughness. At any rate, whether he worked in any one of his publications rather as logician or as general philosopher, Peirce had no interest in founding a school, belonged to none of the existing schools, had a wide range of appreciation for other minds, and a very great disposition to bind inductive methods with speculative interests.

That Peirce should be classed amongst the evolutionists is, for many reasons, natural. His early education was finished, and his maturer scientific work begun, in the great decades of the modern evolutionary movement. His principal contribution to fundamental logical theory, that is, his own highly technical definition of the three categories or modes of being,¹ which he made fundamental in all his speculations, was published in the year 1867 in the "Proceedings of the American Academy of Arts and Sciences in Boston." His essays on scientific method in the *Popular Science Monthly* were printed in the early seventies,—I believe from 1873 to 1876. "The Studies in Logic," by the members of the Johns Hopkins University, a book composed partly by himself and partly by his advanced students in logic at Baltimore, was published in the early eighties. Thus, his work brings him into close contact with the formative period of the modern doctrine of evolution.

But Peirce was never a follower of Spencer, whose relation to natural science was not such as seemed satisfactory to a mind of Peirce's type and training. Nor was Peirce very prominently influenced by Darwin, although, of course, he knew Darwin well. For Peirce was, once for all, a man rather of physical and chemical training and of practise in the use of various instruments of precision, than a man at all carefully trained in the biological sciences. His interest in human nature was wide and varied, and, in his fragmentary way, he contributed notably to the study of various psychological problems—in particular, to problems relating to the threshold of sensation, and to various other problems of the psychology of perception.

¹ (1) Things, that is, individuals; (2) objects of conception, that is, universals; and (3) signs. Peirce often mentioned, in conversation, these "three sorts of being" as the essential feature of his philosophy.

The "evolution" of Peirce was therefore no variation of the evolutionary philosophy of Spencer or of Spencer's disciple, Fiske. Such minds left him uninterested. History, and especially the history of thought, and in particular of the various natural sciences, interested Peirce deeply. But his mind, when he thought of evolution, turned its attention to the matters which most fascinated him as a logician. He wanted to know not merely about the evolution of any one group of physical phenomena, whether stellar or terrestrial, whether organic or inorganic. He wanted to know about how the laws of nature came to be what they now are. For him the doctrine of evolution was to be, if it should succeed at all, a doctrine of the evolution of the laws of nature, a doctrine regarding how the world came to acquire not the plants, nor the animals, nor the solar systems, nor the Milky Way, that now it has, but how the laws of nature came to be what they are at all.

Peirce's speculations upon these topics were very highly original, were continued over a period of very many years, were perhaps the most characteristic productions of his whole personal character and mental interest which, apart from his technical logical researches, we possess. These speculations very greatly interested William James and played their part in the formulation of that whole "philosophy of change" on which William James's latest interests were most centered. Yet to James the principal illustrations of this doctrine of the evolution of natural law always remained unfamiliar and somewhat too technical, so that James listened, in company in which I was sometimes privileged to be present—listened, I say, to these aspects of Peirce's philosophy with an interest which certainly did not follow Peirce's thought into precisely those regions which Peirce himself most valued. The ideas here in question are so manifold and complex that I can not hope to give you any adequate idea of them. Let me simply indicate a few of them.

Most philosophers, if they concern themselves with the laws of nature at all, begin by regarding certain fairly simple laws, as, so to speak, the only examples of canonical and legitimate sorts of natural law that we ought to recognize. Mechanical laws or exactly quantitative laws or formulas capable of precise natural formulation, these such philosophers regard as the reasonable sorts of law. In case a man does not believe that these types of law are universal, are pervasive, or are canonical, his philosophy is usually likely to be some sort of teleology, or some doctrine that freedom, or that spiritual significance rules the world, and that exact law is subordinate to more or less sentimentally conceived ideals.

But Peirce's philosophy was dominated by quite other modes of

thinking whose origin lay partly in his experience in dealing with the problem offered by the efforts of science to eliminate or to reduce to rule the errors which are encountered in the actual measurements which the physical sciences endeavor to make. Partly his ideas on these subjects were due to still more general logical considerations which influenced him greatly from the time they first met his notice. The laws of nature that we actually confirm—so Peirce was accustomed to say—are laws which, so far as we can verify them, are *approximately* true. All measurements are inexact, and have to be corrected by further measurements. The moon which astronomers observe, especially if the observations extend over many centuries, as, 'by the study of the records of ancient eclipses we can make them extend—the moon of observation—never agrees precisely with the ideal moon which the astronomical theory demands. Of course as astronomical knowledge grows toward perfection, the discrepancy between theory and fact grows less. That is simply because the better we know nature, the more we can discover how to adjust theory and fact, one to the other. But if we extend our survey of nature from the instant to the year, from the year to the century, from the century to the geological period, or to the evolution of a stellar system, we get evidence that natural laws which hold with appreciable exactness and within the errors of probable observation, during short periods of time, no longer hold with such precision for very long periods of time. There is a reasonable inductive evidence that the laws which nature follows are themselves only approximately true and are subject to evolution, so that Newton's law of gravitation is presumably very nearly true at the present time for the present moon and planets, for the present stellar systems. But it is equally probable that this law is even now only a close approximation, not an absolutely necessary order of things. For similar inductive reasons, it becomes probable that, in so far as Newton's law of gravitation now holds true, it did not always hold true, and that this, like all other laws of nature, is a product of evolution.

What an inductive study of nature makes probable, Peirce was accustomed to regard as what the rightly trained mind of the logical student of nature would regard as that which would be likely to be characteristic of a nature in which evolution has taken place. For Peirce rejected, upon logical grounds, the doctrine that the natural world or any other portion of the universe known to us, must necessarily be subject to any *a priori* laws, except the purely logical ones, or to a perfectly exact law of causation. Regularity, as Peirce was especially fond of saying, is not necessarily a self-evident type of any real world which is known to us. Regularity, where it exists and in

so far as it exists, is precisely that aspect of the world *which most stands in need of explanation*. If you find a pack of cards lying in confusion, you suppose that to be the natural result of their having been thrown down in a chance way by somebody whose dealings with them were governed by no necessary, rigid, or precise law. That is, the chance disorder of the pack of cards thrown down at random needs, on the whole, no explanation. But if you find the cards in some precise order, as, for instance, in the order required by a certain hand in a certain game, then you stand in the presence of a fact which needs explanation. You very properly and logically ask why they came to be in this order.

Precisely so the relatively chance order of the starry heavens in the region of the Milky Way calls for no scientific explanation. But if the planets conform to Kepler's laws, if the moon of astronomical theory approximately agrees with the moon of observation, it is, logically speaking, a fair question to ask why the planets and the moon behave thus, or, in evolutionary terms, how they came to do so.

Precisely so Newton's laws of motion, in so far as they are approximately true of the physical world, demand an explanation and an evolutionary explanation. If such can be hypothetically furnished, we thereby come to see why and how the Newtonian natural laws have come to characterize the real world.

Thus every sort of natural law, precisely in so far as it is approximately exact law, logically demands, if possible, an explanation in terms of the theory of the evolution of natural law. And, empirically speaking, as Peirce was never weary of insisting, there is a wide range of empirical evidence that the present laws of nature are the products of an evolutionary process. In this thought consisted the evolutionary theory of Peirce. A brief mention now of some of his other leading ideas must close this essay on his philosophy.

The second of Peirce's leading ideas dominated his highly remarkable and original version of inductive logic. I have sometimes ventured to call this doctrine by a name which Peirce himself, in some of his early papers, suggests by his illustrations, though I believe that he had never formally used it. This name is the "Insurance Theory of Induction." I have no time to expound it here. It was originally set forth in the series of articles in the *Popular Science Monthly* entitled "Illustrations of the Logic of Science."

The third leading idea of Peirce's philosophy to which I wish to direct attention results from his theory of the evolution of natural law, and expresses the result of his most synthetic survey of cosmological problems. This is the theory according to which chance is objective, and the whole universe expresses a process that has two

extremes, with chance as a limit towards one end and rigid necessity as a limit at the other end of an endless temporal process.

The fourth of Peirce's leading ideas relates to the teleological and mental aspect of the world, that is, to the idealistic tendency which formed a motive in Peirce's thought, but which never became amplified in a dogmatic idealistic metaphysics. This idea had a certain similitude to ideas which Bergson has recently made interesting, though there is never very close agreement between Peirce's ideas and those of Bergson. But Peirce has his own theory as to the part which intuition plays in the work of the human mind and in the guidance of scientific research. Peirce's thoughts on this subject are fragmentary. Indeed his entire life work may in a certain sense be called fragmentary. Yet it is my belief that his ideas will amply repay study. As he himself says in the conclusion to that brilliant essay, "The Architecture of Theories,"—"may some future student go over this ground again and have the leisure to give his results to the world."

THE PEIRCE MANUSCRIPTS

All the remaining papers of Peirce have now been placed under the joint care of the Harvard department of philosophy and of the Harvard library. The papers are in many ways fragmentary, but may be regarded with confidence as containing some very important things. We have also in our possession copies of his various published essays, which are also somewhat fragmentary and which in their original publications were pretty widely distributed in various journals and learned transactions. A word about these seems in order before passing on to a description of Peirce's unpublished papers and manuscripts.

Of Peirce's published works the most important from a purely scientific standpoint was a photometric research upon a group of stars selected for that purpose by Professor Pickering, the results of this research being still valuable, despite the changes in modern methods which have taken place in the field.

Another contribution of Peirce's to the world's storehouse of scientific knowledge is none the less valuable because it is generally unknown. I refer to the scientific vocabulary of the first edition of the Century Dictionary, of which Peirce was the author in so far as that portion of the Century Dictionary had any one author at all. Peirce's vast erudition in the history of science and particularly his familiarity with scholastic philosophy to which he was long devoted made his work as a dictionary-maker exceedingly valuable.

Nearer to philosophy one comes perhaps when one speaks of Peirce's researches on the algebra of logic and in particular in the

logic of relatives. Many of the most recent researches, including those of Bertrand Russell, are still due to his influence, although Russell, as I think, has a somewhat inadequate sense of his own generally indirect indebtedness to Peirce's work in this field. The logical essays of Peirce which deal with synthetic logic and with the logic of relatives were collected and brought into a sort of a synthesis by Schroeder. A list of them can be found in Schroeder's "Algebra der Logik" (Appendix to Vol. 1).

Distinct from these researches in exact and, in general, in deductive logic are Peirce's manifold contributions to the logic of induction. The most important essays of Peirce in this field appeared in the early seventies of the last century in the *Popular Science Monthly* under the general heading of "Illustrations of the Logic of Science." Of the researches of Peirce on this subject, I do not hesitate to say that they are still very imperfectly appreciated and are of enormous importance.

As is well known, William James considered Peirce as the father of pragmatism. Yet what little Peirce published on this subject will go to bear out the remark that there is little in common between his pragmatism and that of James. Peirce's *Monist* article entitled "The Issues of Pragmatism" was written for the express purpose of maintaining the independence of his thought from either the pragmatism of James or the humanism of Schiller. The word *pragmatism* seemed to him best to describe the philosophy of these two thinkers. As for Peirce himself, when he saw his pragmatism threatened with too much popularity he found it easy to take refuge in a new word, namely, "pragmaticism" which, as he liked to say, "seems ugly enough to escape the kidnappers."

It is not always easy to understand Peirce. He never regretted the fact that most people found it hard to follow his ideas. He deliberately chose that most of his researches should be concerned with highly technical topics and should be secure from the intrusion of the uncalled. Upon occasion he could be brilliantly clear in his expressions of highly complex and recondite problems, although this clearness was a capricious fact in his life and in his writings, and was frequently interrupted by a mode of expression which often seemed to me to be due to the fear, after all, that in case mediocre minds found themselves understanding too many of his ideas, they would be led to form too high an impression of their own powers. One finds this tendency towards what might be called "impenetrability" especially evident in his manuscripts. Too often the reader meets with a thought of surpassing brilliancy and follows it eagerly, only to have it disappear like the cuttlefish in an inky blackness of its own secretion.

The most complete manuscripts of the Peirce collection include copies of the "Lectures on Pragmatism" which were delivered privately to a circle of friends in Cambridge and of the Lowell Lectures on Logic of 1903-4. It was these latter which James described as "flashes of brilliant light relieved against Cimmerian darkness—"darkness" indeed to James as to many others must have seemed those portions on "Existential Graphs" or "Abduction." Yet it seems strange that the very striking lectures on "Induction," "Probability," "Chance," and "Multitude" should have attracted nothing more than a passing notice.

The two works, which, if they could ever have been completed, were intended by Peirce to be the proper fruits of his studies, were a "History of Science" and a "Comprehensive Treatise on Logic." Both of these remain unfinished; and the value of his fragmentary manuscripts will largely depend upon the extent to which future editorial work can bring into unity the very considerable fragments which his remains contain of the studies which were intended to form part of these works. So far as his erudition and inventiveness were conditions for the writing of these two intended books, Peirce possessed both these characters most abundantly. No greater mind has ever appeared in America in respect of the powers needed for the writing of these two projected works. No more ample erudition has ever existed amongst us regarding the topics which were here in question.

Of especial importance from an historical standpoint are the writings of Peirce which deal with Aristotle and with the scholastic philosophy. Aristotle, Peirce read in the original carefully and for many years, and his manuscripts contained many original expressions of his independent opinion about the problems connected with the interpretation of the Aristotelian philosophy. For the scholastic philosophy Peirce always had a very great interest. Duns Scotus was among his favorites, both as logician and as metaphysician. He was not attracted to the Scholastics by any of their theological relations, but by an interest in their skilfully devised vocabulary, and in the beautiful array of their word conceptions. A treatise which I recently found among his manuscripts entitled "Duns Scotus and Occam" sets forth very clearly the issues of realism and nominalism in the light of modern thought and goes far towards showing that many contemporary philosophers, as, for instance, Bertrand Russell, are not so far away from scholasticism as the calendar might indicate.

The following constitutes a list of the titles of the more important among the Peirce manuscripts. It is far from being complete, yet it may serve to suggest the varied and in many respects original nature of Peirce's philosophical and scientific researches.

"On Retroduction, Induction, and Abduction." "Minute Logic." "Treatise in Logic": Chapter I, "Prelogical Ideas"; Chapter IV, "Ethics"; Chapter VI, "The Three Kinds of Signs"; Chapter VII, "The Aristotelian Syllogistic"; Chapter VIII, "The Algebra of the Copula"; Chapter XI, "On Logical Breadth and Depth"; Chapter XIII, "Simplification of Dual Relatives"; Chapter XIV, "Quantification of the Predicate"; Chapter XV, "Existential Graphs." "Synechism." "Lectures on the British Logicians." "Positivism." "Aristotle on Categories." "Molecules and Molecular Theory." "Prospect of Air Sailing." "On Representation." "On small Differences in Sensation." "Notes on Royce's World and Individual." "Illustrations of Dynamics." "Theory of Numbers." "Refutation of Transcendentalism." "*A Priori* and *A Posteriori*." "The Seven Systems of Metaphysics." "Quantity and Quality." "On Multitude and Number." "Logic of History." "Lectures on Kant." "On Mind and Matter." "Logic of Continuity." "On the Associations of Ideas." "Spinoza." "Hume—a Critical History of Logical Ideas."

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THE PRAGMATISM OF PEIRCE

THE term pragmatism was introduced into literature in the opening sentences of Professor James's California Union address in 1898. The sentences run as follows: "The principle of pragmatism, as we may call it, may be expressed in a variety of ways, all of them very simple. In the *Popular Science Monthly* for January, 1878, Mr. Charles S. Peirce introduces it as follows:" etc. The readers who have turned to the volume referred to have not, however, found the word there. From other sources we know that the name as well as the idea was furnished by Mr. Peirce. The latter has told us that both the word and the idea were suggested to him by a reading of Kant, the idea by the "Critique of Pure Reason," the term by the "Critique of Practical Reason."¹ The article in the *Monist* gives such a good statement of both the idea and the reason for selecting the term that it may be quoted *in extenso*. Peirce sets out by saying that with men who work in laboratories, the habit of mind is molded by experimental work much more than they are themselves aware. "Whatever statement you may make to him, he [the experimentalist] will either understand as meaning that if a

¹ See article on "Pragmatism," in "Baldwin's Dictionary," Vol. II., p. 322, and the *Monist*, Vol. 15, p. 162.

given prescription for an experiment ever can be and ever is carried out in act, an experience of a given description will result, or else he will see no sense at all in what you say." Having himself the experimental mind and being interested in methods of thinking, "he framed the theory that a *conception*, that is, the rational purport of a word or other expression, lies exclusively in its bearing upon the conduct of life; so that, since obviously nothing that might not result from experiment can have any direct bearing upon conduct, if one can define accurately all the conceivable experimental phenomena which the affirmation or denial of a concept could imply, one will have therein a complete definition of the concept, and *there is absolutely nothing more in it*. For this doctrine, he invented the name *pragmatism*."

After saying that some of his friends wished him to call the doctrine *practicism* or *practicalism*, he says that he had learned philosophy from Kant, and that to one "who still thought in Kantian terms most readily, *praktisch* and *pragmatisch* were as far apart as the two poles, the former belonging to a region of thought where no mind of the experimentalist type can ever make sure of solid ground under his feet, the latter expressing relation to some definite human purpose. Now quite the most striking feature of the new theory was its recognition of an inseparable connection between rational cognition and human purpose."²

From this brief statement, it will be noted that Peirce confined the significance of the term to the determination of the meaning of terms, or better, propositions; the theory was not, of itself, a theory of the test, or the truth, of propositions. Hence the title of his original article: "How to Make Ideas *Clear*." In his later writing, after the term had been used as a theory of truth,—he proposed the more limited "pragmaticism" to designate his original specific meaning.³ But even with respect to the meaning of propositions, there is a marked difference between his pragmaticism and the pragmatism of, say, James. Some of the critics (especially continental) of the latter would have saved themselves some futile beating of the air, if they had reacted to James's statements instead of to their own associations with the word "pragmatic." Thus James says in his California address: "The effective meaning of any philosophic proposition can always be brought down to some particular conse-

² Kant discriminates the laws of morality, which are *a priori*, from rules of skill, having to do with technique or art, and counsels of prudence, having to do with welfare. The latter he calls pragmatic; the *a priori* laws practical. See "Metaphysics of Morals," Abbott's trans., pp. 33 and 34.

³ See the article in the *Monist* already mentioned, and another one in the same volume, p. 481, "The Issues of Pragmaticism."

quence, in our future practical experience, whether active or passive; the point lying rather in the fact that the experience must be *particular*, than in the fact that it must be *active*." (Italics mine.)

Now the curious fact is that Peirce puts more emphasis upon practise (or conduct) and less upon the particular; in fact, he transfers the emphasis to the general. The following passage is worth quotation because of the definiteness with which it identifies meaning with both the future and with the general. "The rational meaning of every proposition lies in the future. How so? The meaning of a proposition is itself a proposition. Indeed, it is no other than the very proposition of which it is the meaning: it is a translation of it. But of the myriads of forms into which a proposition may be translated, which is that one which is to be called its very meaning? It is, according to the pragmaticist, that form in which the proposition becomes applicable to human conduct, not in these or those special circumstances nor when one entertains this or that special design, but that form which is most applicable to self-control under every situation and to every purpose." Hence, "it must be simply the general description of all the experimental phenomena which the assertion of the proposition virtually predicts." Or, paraphrasing, pragmatism identifies meaning with formation of a habit, or way of acting having the greatest generality possible, or the widest range of application to particulars. Since habits or ways of acting are just as real as particulars, it is committed to a belief in the reality of "universals." Hence it is not a doctrine of phenomenalism, for while the richness of phenomena lies in their sensuous quality, pragmatism does not intend to define these (leaving them, as it were, to speak for themselves), but "eliminates their sential element, and endeavors to define the rational purport, and this it finds in the purposive bearing of the word or proposition in question." Moreover, not only are generals real, but they are physically efficient. The meanings "the air is stuffy" and "stuffy air is unwholesome" may determine, for example, the opening of the window. Accordingly on the ethical side, "the pragmaticist does not make the *summum bonum* to consist in action, but makes it to consist in that process of evolution whereby the existent comes more and more to embody those generals . . . ; in other words, becomes, through action an embodiment of rational purports or habits generalized as widely as possible."⁴

The passages quoted should be compared with what Peirce has to say in the Baldwin Dictionary article. There he says that James's

⁴ It is probably fair to see here an empirical rendering of the Kantian generality of moral action, while the distinction and connection of "rational purport" and "sensible particular" have also obvious Kantian associations.

doctrine seems to commit us to the belief "that the end of man is action—a stoical maxim which does not commend itself as forcibly to the present writer at the age of sixty as it did at thirty. If it be admitted, on the contrary, that action wants an end, and that the end must be something of a general description, then the spirit of the maxim itself . . . would direct us toward something different from practical facts, namely, to general ideas. . . . The only ultimate good which the practical facts to which the maxim directs attention can subserve is to further the development of concrete reasonableness. . . . Almost everybody will now agree that the ultimate good lies in the evolutionary process in some way. If so, it is not in individual reactions in their segregation, but in something general or continuous. Synecism is founded on the notion that the coalescence, the becoming continuous, the becoming governed by laws, the becoming instinct with general ideas, are but phases of one and the same process of the growth of reasonableness. This is first shown to be true with mathematical exactitude in the field of logic, and is thence inferred to hold good metaphysically. It is not opposed to pragmatism . . . but includes that procedure as a step."

Here again we have the doctrine of pragmatism as a doctrine that meaning or rational purport resides in the setting up of habits or generalized methods, a doctrine passing over into the metaphysics of synecism. It will be well now to recur explicitly to Peirce's earlier doctrine which he seems to qualify—although, as he notes, he upheld the doctrine of the reality of generals even at the earlier period. Peirce sets out, in his article on the "Fixation of Belief,"⁵ with the empirical difference of doubt and belief expressed in the facts that belief determines a habit while doubt does not, and that belief is calm and satisfactory while doubt is an uneasy and dissatisfied state from which we struggle to emerge; to attain, that is, a state of belief, a struggle which may be called inquiry. The sole object of inquiry is the fixation of belief. The scientific method of fixation has, however, certain rivals: one is that of "tenacity"—constant reiteration, dwelling upon everything conducive to the belief, avoidance of everything which might unsettle it—the will to believe. The method breaks down in practise because of man's social nature; we have to take account of contrary beliefs in others, so that the real problem is to fix the belief of the community; for otherwise our own belief is precariously exposed to attack and doubt. Hence the resort to the method of authority. This method breaks down in time by the fact

⁵ *Popular Science Monthly*, Volume XII., pp. 1-15. It is much to be desired that the series of articles be printed in book form. Discussion since 1878 has caught up with Peirce, and his views would awaken much more response now than when published.

that authority can not fix all beliefs in all their details, and because of the conflict which arises between organized traditions. There may then be recourse to what is "agreeable to reason"—a method potent in formation of taste and in esthetic productions and in the history of philosophy,—but a method which again fails to secure permanent agreements in society, and so leaves individual belief at the mercy of attack. Hence, finally, recourse to science, whose fundamental hypothesis is this: "There are real things, whose characters are entirely independent of our opinions about them; those realities affect our senses according to regular laws, and . . . by taking advantage of the laws of perception, we can ascertain *by reasoning* how things really are, and any man, if he have sufficient experience and reason enough about it, will be led to the one true conclusion."⁶

It will be noted that the quotation employs the terms "reality" and "truth," while it makes them a part of the statement of the *hypothesis* entertained in scientific procedure. Upon such a basis, what meanings attach to the terms "reality" and "truth?" Since they are general terms, their meanings must be determined on the basis of the effects, having practical bearings, which the object of our conception has. Now the effect which real things have is to cause beliefs; beliefs are then the consequences which give the general term reality a "rational purport." And on the assumption of the scientific method, the *distinguishing* character of the *real* object must be that it tends to produce a single universally accepted belief. "All the followers of science are fully persuaded that the processes of investigation, if only pushed far enough, will give one certain solution to every question to which they can be applied." "This activity of thought by which we are carried, not where we wish, but to a fore-ordained goal, is like the operation of destiny. . . . This great law is embodied in the conception of truth and reality. The opinion which is fated to be ultimately agreed to by all *who investigate*, is what we mean by the truth, and the object represented in this opinion is the real."⁷ In a subsequent essay (on the "Probability of Induction") Peirce expressly draws the conclusion which follows from this statement; viz., that this conception of truth and reality makes everything depend upon the character of the methods of inquiry and inference by which conclusions are reached. "In the case of synthetic inferences we know only the degree of trustworthiness of our proceeding. As all knowledge comes from synthetic inference, we must also infer that all human certainty consists merely in our knowing that the processes by which our knowledge has been derived are such as

⁶ *Ibid.*, p. 11.

⁷ *Ibid.*, pp. 298-300, *passim*.

must generally have led to more, being those which enquiries.

Summing up, we may trine concerning the mean objects, namely, that these ceivably have practical beception to have. Then, ou of our conception of the obj of its sensible effects," and really believe the effects to ourselves whether or no we ence. In short our own resy or testing, ingredients in ou sense of the word pragmat matist than James.

He is also less of a nomin less the *particular* sensible the generic attitude of respo with a thing. In the passa speaks as if in his later life h more to "concrete reasonab may well be that the relative most but a difference of emph rationality means a change action, and through action specific existence consists in earlier writing, the emphasis explicit. "What a thing me More elaborately, "Induction is a habit. That a habit is every belief is of the nature character, has been shown in

The difference between Pe the greater emphasis placed cedure. As the quotations al turned, for Peirce, upon the inquiry. Hence his high esti—at least James in his later of the appeal to the Will to Be

⁸ *Ibid.*, p. 718.

⁹ *Ibid.*, p. 293.

¹⁰ *Ibid.*, p. 292.

¹¹ *Popular Science Monthly*, Vol.

the method of tenacity. Closely associated with this is the fact that Peirce has a more explicit dependence upon the social factor than has James. The appeal in Peirce is essentially to the consensus of those who have investigated, using methods which are capable of employment by all. It is the need for social agreement, and the fact that in its absence "the method of tenacity" will be exposed to disintegration from without, which finally forces upon mankind the wider and wider utilization of the scientific method.

Finally, both Peirce and James are realists. The reasonings of both depend upon the assumption of real things which really have effects or consequences. Of the two, Peirce makes clearer the fact that in philosophy at least we are dealing with the *conception* of reality, with reality as a term having rational purport, and hence with something whose meaning is itself to be determined in terms of consequences. That "reality" means the object of those beliefs which have, after prolonged and cooperative inquiry, become stable, and "truth" the quality of these beliefs is a logical consequence of this position. Thus while "we may define the real as that whose characters are independent of what anybody may think them to be . . . it would be a great mistake to suppose that this definition makes the idea of reality perfectly clear."¹² For it is only the outcome of persistent and conjoint inquiry which enables us to give intelligible meaning in the concrete to the expression "characters independent of what anybody may think them to be." (This is the pragmatic way out of the egocentric predicament.) And while my purpose is wholly expository I can not close without inquiring whether recourse to Peirce would not have a most beneficial influence in contemporary discussion. Do not a large part of our epistemological difficulties arise from an attempt to define the "real" as something given prior to reflective inquiry instead of as that which reflective inquiry is forced to reach and to which when it is reached belief can stably cling?

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CHARLES S. PEIRCE AT THE JOHNS HOPKINS

THE keenest pleasure which can offer itself to the university student who is about to grapple with the profoundest thinking that the world has done and is doing is his when he finds himself by chance in the actual presence of one of the creators of the world's store of thought. This had been the happy lot of the students of the

¹² *Popular Science Monthly*, Vol. XII., p. 298.

Johns Hopkins University from its opening days. They felt, with reason, that they were assisting at the foundation of an important new development in university life in this country. For the first time the atmosphere of the great European centers of research had been created in America. Departments headed by such men as Sylvester, Gildersleeve, Remsen, Rowland, Martin, a group of scholars all fitted to inspire their students with the ardor of research—this was something new. To this atmosphere the students of those early days, reinforced by enthusiastic young *docents* fresh from their experience of the then simple and ideal German university life, responded with due appreciation of the lucky days upon which they had fallen. Probably there has never been in this country a center of learning where the conditions were more ideal for producing in its best form the joy of the intellectual life—nor a group of students better fitted to profit by their novel opportunities. To share the life of this ardent body of workers was, they one and all felt, an experience to be remembered.

To this group of students, eager for intellectual adventure, came, in 1880–1881, Charles S. Peirce. His reputation had preceded him, and his hearers were quickly receptive to the inspiration to be had from one more master mind. Sylvester and Peirce both possessed recognized elements of the temperament of genius—a thing which adds much to the effectiveness of personal intercourse with a great man—but that temperament was exhibited in them in very different forms. Sylvester was as oblivious as Peirce of the presence of his audience (though he did once by chance discover, to his evident amazement, that his most distinguished auditor, Professor Cayley, was fast asleep, his bald head frankly covered with his handkerchief), but he had a boyish enthusiasm which was in full harmony with his fresh English color and his nervous Jewish temperament. He was always brimming over with the importance of his subject-matter, which had usually been produced during the three days' interval between his lectures, and which was brought forth with the keen joy of the immediate discoverer. Peirce, on the contrary, was of the brooding type. He sat when he addressed his handful of students (who turned out afterwards, however, to be a not unimportant handful) and he had all the air, as has been noted by Professor Jastrow, of the typical philosopher who is engaged, at the moment, in bringing fresh truth by divination out of some inexhaustible well. He got his effect not by anything that could be called an inspiring personality, in the usual sense of the term, but rather by creating the impression that we had before us a profound, original, dispassionate and impassioned seeker of truth. No effort was made to create a connected and not inconsistent whole out of the matter of each lecture. In fact,

so devious and unpredictable was his course that he once, to the delight of his students, proposed at the end of his lecture, that we should form (for greater freedom of discussion) a Metaphysical Club, though he had begun the lecture by defining metaphysics to be "the science of unclear thinking."

Several of Professor Sylvester's students—understanding that the New Logic which Professor Peirce professed had connections with existing mathematics and that, even if it had not, it was something which, unlike the mechanical logical exercises of the schools, was expected to have a vivifying and clarifying effect upon one's actual reasoning processes—joined his class in logic, composed otherwise, of course, of students of philosophy. This mixed character of the audience, as is too often the case in lectures on modern logic, made it impossible for the lecturer to adapt his subject-matter with exactness to the needs of either part. Peirce's lectures did not go very extensively into the details of his mathematical logic (Symbol Logic, I maintain, is the only proper name for it, and I note with pleasure that Dr. Karl Schmidt has adopted this term). His lectures on philosophical logic we should doubtless have followed to much greater advantage if he had recommended to us to read his masterly series of articles on the subject which had already appeared in the *Popular Science Monthly* in 1878 under the title "Some Illustrations of the Logic of Science." We should have had from these at first hand a better idea of "how to make our ideas clear" concerning the methods of science as he understood them. But that, in spite of his apparent aloofness and air of irresponsibility, he really had the interests of his hearers deeply at heart will appear from a sympathetic letter which he wrote me some years later, when I came to lecture myself on logic at the Johns Hopkins University:

MILFORD, PA.

Thanksgiving Day, 1902

My dear Mrs. Franklin: It gives me joy to learn that you are to lecture on logic at the Johns Hopkins. But, oh, you will not have such a wonderful and charming class as I had, especially the first year. In those days I knew very little about logic, and did not even thoroughly understand upon what logic is based. I was not in possession of the proof that the science of logic must be based on the science of ethics, although I more or less perceived that sound reasoning depends more on sound morals than anything else. I at any rate tried hard to see what I was about, and not to build logic upon anything that must on the contrary be built upon it. In a certain measure I appreciated the precise nature of the utility of logic, and rated it high; but I did not know what I know now. I am finding out every day something new to me in logic.

I wish most earnestly that you may succeed in animating your students with the true spirit of science and of logic, and that is the very

greatest happiness I could wish for you. Whether you do or not depends chiefly on how much you care to do so.—I return Keynes.

Very faithfully,

C. S. PEIRCE.

P. S. I hope that Schröder's manuscripts will be printed. I would do anything in my power to that end. Can't you find out what is needed?

The following letter, which I have quoted in part, indicates, among other things, the extreme value which Peirce attributed to his form of pragmatism. The important collection of his reprints which he presented to me at this time, I have now deposited in the library of Columbia University. This letter, too, is not so much a personal letter as it is a definitive setting out of some of his views and experiences; if he has left no complete autobiography, it should furnish important material concerning the wonderful intellectual life which he took part in, in Cambridge, during his early years.

My dear Mrs. Franklin: It is most kind of you to think of me and of doing what you propose, and it happens that, just at this time, it would be very serviceable to me. For in a forthcoming number of the *Monist*, I am to have an article about pragmatism, explaining what I conceive it to be. Although James calls himself a pragmatist, and no doubt he derived his ideas on the subject from me, yet there is a most essential difference between his pragmatism and mine. My point is that the meaning of a *concept* . . . lies in the manner in which it could *conceivably* modify purposive action, and *in this alone*. James, on the contrary, whose natural turn of mind is away from generals, and who is besides so soaked in ultra-sensationalist psychology that like most modern psychologists he has almost lost the power of regarding matters from the logical point of view, in defining pragmatism, speaks of it as referring ideas to *experiences*, meaning evidently the sensational side of experience, while I regard *concepts* as affairs of habit or disposition, and of how we should react. Without particularly referring to him, my *Monist* article (already sent in and accepted) is to explain what my position is; and I desire to follow it up by two others, of which the first shall show how this principle at once affords solutions of a great variety of problems, and shall show what the general color of those solutions is, while the third article shall show what facts and phenomena I appeal to as proving the truth of the pragmatist principle. But it is altogether problematical whether the second and third articles ever appear. It all depends upon whether the readers of the *Monist* are interested in the first article. Now if you were to write what you propose, it would call attention to the first article, increase the sales of that number of the *Monist*, and render the acceptance of a second much more likely. I have no fears but that the second should excite of itself sufficient interest to insure the third; but the first, being a definition of an individual opinion, is not calculated to attract new readers.

It is true that I have not received much credit either for pragmatism or any other part of my work. However, as it was not done for the sake

of anything of that kind, I have no reason to complain. What I expected to gain when I did it, I have gained. I began on the scale of printing a logical research every month. My motive then was a mixed one. I wanted the statement of my results in print for my own convenience in referring to them, and I thought it would be a gain to civilization to have my entire logical system. But after a very few months, I found that nobody took any notice of my papers, and I lost all interest in their publication, and simply filed away my mss. for my own use.

It must have been about 1857 when I first made the acquaintance of Chauncey Wright, a mind about on the level of J. S. Mill. He was a thorough mathematician of the species that flourished at that time, when dynamics was regarded (in America) as the top of mathematics. He had a most penetrating intellect. There were a lot of superior men in Cambridge at that time. I doubt if they could have been matched in any other society as small that existed at that time anywhere in the world. Wright, whose acquaintance I made at the house of Mrs. Lowell, was at that time a thorough Hamiltonian; but soon after he turned and became a great admirer of Mill. He and I used to have long and very lively and *close* disputations lasting two or three hours daily for many years. In the sixties I started a little club called the Metaphysical Club. It seldom if ever had more than half a dozen present. Wright was the strongest member and probably I was next. Nicholas St. John Green was a marvelously strong intelligence. Then there were Frank Abbott, William James, and others. It was there that the name and the doctrine of pragmatism saw the light. There was in particular one paper of mine that was much admired and the ms. went around to different members who wished to go over it more closely than they could do in hearing it read. While I was in charge of the Coast Survey office in 1873, I employed some Sundays in putting that piece into a literary form, though without any intention of printing it. But in 1875 or 1876 I met old William Appleton, the publisher, on a steamer, and he offered me a good round price for some articles for the *Popular Science Monthly*. I patched up the piece I speak of for the first; and it appeared in November, 1877. In the autumn of 1877 I went abroad in order to urge a certain truth upon the Geodetical Association. As I should have to speak in French and conduct a discussion in that language, by way of practise I began and finished on the voyage between Hoboken and Plymouth an article about pragmatism in French. I afterward translated into French my article of November, 1877, and these two appeared in the *Revue Philosophique*, about Volume VI. I left in the library of the J. H. University a bound volume of my pieces containing these two. I have not a copy of either now. I should say that the *word* pragmatism does not appear in that article, nor did I insert it in the Century Dictionary or ever use it in print previous to the article in Baldwin's Dictionary. I translated the steamer article into English and in that dress it appeared in the *Popular Science* of January, 1878, some time previous to the publication of the original text.

There never was the smallest disloyalty on James's part. On the contrary, he has dragged in mention of me whenever he could.

In the spring of 1903 I was invited, by the influence of James, Royce,

and Münsterberg, to give a course of lectures in Harvard University on Pragmatism. I had intended to print them; but James said he could not understand them himself and could not recommend their being printed. I do not myself think there is any difficulty in understanding them, but all modern psychologists are so soaked with sensationalism that they can not understand anything that does not mean that, and mistranslate into the ideas of Wundt whatever one says about logic. . . . How can I, to whom nothing seems so thoroughly real as generals, and who regard Truth and Justice as *literally* the most powerful powers in the world, expect to be understood by the thoroughgoing Wundtian? But the curious thing is to see Absolute Idealists tainted with this disease,—or men who, like John Dewey, hover between Absolute Idealism and Sensationalism. Royce's opinions as developed in his "World and Individual" are extremely near to mine. His insistence on the element of purpose in intellectual concepts is essentially the pragmatistic position. . . .

Pragmatism is one of the results of my study of the formal laws of signs, a study guided by mathematics and by the familiar facts of everyday experience and by no other science whatever. It is a maxim of logic from which issues a metaphysics very easily. It solves almost all problems of metaphysics in short metre and it solves them in such a way as never to bar the way of any positive inquiry. It also has the gratifying effect of encouraging the simplest ideas of religion and anthropomorphic conceptions of the Absolute.

I have some of my quarto papers bound up together and I am sending you this volume begging your acceptance of it. I wish I had copies of some of my octavo papers bound up; but I have not. I have some loose copies of some of them which I would have bound for you; but one never knows when a binder is going to send one's books home. One only knows that he will try to do so in time to get the bill paid before both parties die. So I send such papers as I can find, as they are, along with a few newspapers containing articles on "French Academy," "Napoleon Bonaparte," "Great Men of the Nineteenth Century," etc.

With best regards to Mr. Franklin,

Very faithfully,

C. S. PEIRCE.

Professor Peirce had a mind of great originality and productiveness; he lacked, no doubt, as do too many geniuses, that keen self-criticism which would have enabled him to distinguish rigidly, in what he produced, between the wheat and the chaff. Much of what he wrote, especially during the later years of his life, was incomprehensible beyond even the privilege of the maker of new philosophies; articles in the *Monist* which William James has said will be a rich mine for the future student will just as probably remain forever indecipherable by him. Once when I was in search of an article of his which had lately appeared in the *Monist*, entitled, in Shakespeare's phrase, "Man's Glassy Essence," and could not remember its name,

the young librarian who assisted me said, "Oh yes,—you mean the article on 'Glacial Man' "—a title which would doubtless have served as well as the other. Indeed, [many of his contributions to the philosophical dictionary were of the purely cabalistic type. The second part of the article on Symbolic Logic, for instance, was finally, against the urgent advice of Professor Couturat, who had himself contributed the admirable first part, sent to the printer, though it is doubtful if any one will ever be able to read it.¹ But it will never be known what reams of closely written matter were excluded!] Professor Peirce had already completed a great part of a book on logic, largely medieval logic, which (save for what came out in the Dictionary) he was never in a position to publish: his future disciples will no doubt see to it that this great work is eventually given to the press. So difficult at the time, however, was the rejection, in the interest of sanity, of such a mass of closely written pages that at last I found it necessary to call in the aid of my husband, who undertook to play the traditionally unpleasant rôle of the candid friend. The ingrained sweetness of Peirce's character—an essential to the acceptance of irksome criticism—is here brought into evidence; in fact, this bit of correspondence may perhaps be regarded as a model of its type,—no easy type.

[MILFORD, PA., Nov., 1900.]

My dear Mrs. Franklin:

I want you kindly to read the enclosed article *Exact Logic* and show it to your husband whose judgment I have much faith in, if he will be so good as to look at it. I told Prof. Baldwin when I took up this work that I should expect "unlimited swing" in exact logic. Still, I don't know but it is too much to ask him to print this; and I don't want to ask what is not right. The purpose of it is to put *Exact Logic* in its place as a branch of philosophy. It is an extremely careful statement of the small ground it covers. I do not see how I could say less without reducing it to a general statement that would be without force. I am too close to it to get a good mental sight at it. I request you to read it and tell me plainly whether it seems to you and your husband calculated to do the cause of exact logic any good, . . . also whether there are any modifications you can suggest, especially to shorten it. A short vocabulary of terms omitted in Vol. I. of the Dictionary will have to be added. You had better, I should think, follow my example in this respect in your articles, inserting, for instance, . . . I should not wonder, if you look into my *Virgo* symbol, but you might find it resulted in a valuable rule of elimination.

Very faithfully,
C. S. PEIRCE.

¹ The death of Professor Couturat, who was run over by a military auto-truck at the beginning of the war, is one of the many irreparable losses of the European war.

My dear Mr. Peirce,

. . . I feel bound to say that, according to one, to be sure, very commonplace idea of entertaining—an article in a cooperative devoted to pioneer work, however em exposition of what is either fairly well is capable of being so expressed with intelligible to the ordinary properly—which you lay down in your article so their adequately intelligible presentation given to them, and, *a fortiori*, far more spare. . . .

My dear Franklin:

Your letter is at hand. I asked thank you for having done it so faithfully between friends! You give me what it, notwithstanding the suggestions of

This same advice, might, I have advantage under later letters of the

If Charles S. Peirce had happened at the Johns Hopkins University cut off during which he was kept up reason by discussions with a com minded students,—there is no doubt of more certain value than it can able, for instance, that his grateful have found his generously provided prehensible to be printed at the time sophical Congresses in Göttingen, i fenders of his views, as against the Italian philosophers, Calderon most acute intellect, is no longer li able to throw much illumination— ing writer—upon the real bearing Peirce.

COLUMBIA UNIVERSITY.

CHARLES S. PEIRCE AS A TEACHER

TO record an impression of Charles S. Peirce as a teacher is a grateful opportunity. A deep conviction of the significance of the problems presented and a mastery of the intellectual processes were his sole and adequate pedagogical equipment. The logical quality was the dominant trait of his thinking; rectitude became a rational virtue. In the deductive field where premises were sharply defined and under control, the orderly development of conclusions was the true function of the well-trained mind, and the mark of the scholar. The "Algebra of Logic" was an expert tool usable only by the expert and extending the scope of the logical grasp. Deeply mathematical, his thinking had not the trace of a scholastic quality; there was no love of the tool for its own sake, but an admiration of its cutting edge as the issue of human care and skill. His interests were comprehensive, though not scattered. In the field of inductive problems the fertility of his resources imparted a breadth to his treatment that brought to the student the constant leadership of a rich mind. His knowledge never gave the impression of a burden, but of strength. His command of the history of science was encyclopedic in the best sense of the word. The hypotheses of the great thinkers of the past were transformed into logical exercises for the present-day student. The great advances of science were due as much (if not more) to an increased hold over the logical instrument as to an enlarged realm of observation. The history of science was a record of man's growth in logical stature. In dealing with the more fluid and versatile considerations of induction, as in the more rigid and closed systems of deductive reasoning, the skilled focusing of his mind excited admiration. The irrelevant was discarded, the significant composition revealed. The chips fell away and the statue in the block appeared. This sense of masterly analysis accomplished with neatness and dispatch,—all seemingly easy, but actually the quality of the highest type of keen thinking—remains as the central impression of a lecture by Professor Peirce.

When I came to the Johns Hopkins University in the autumn of 1882, Mr. Peirce's career was well established. He had inspired a remarkable group of young men, now leaders in intellectual affairs; a group to which is to be added the name of Christine Ladd-Franklin, whose exceptional abilities secured for her exceptional privileges. The "Studies in Logic" by "Members of the Johns Hopkins University" appeared in 1883. The concluding paper which Mr. Peirce contributed to the volume on "A Theory of Probable Inference" exhibits the qualities of his teaching and the charm and lucidity of his

never completed. A number of years later, I was permitted to formulate two rather simple conclusions, the one relating to "Longevity," the other to "Precocity." This was done at a time when such studies were not general, though Galton's work was known. Such a conclusion as that later associated with Dr. Osler's misquoted verdict regarding the correlation of early manhood with germinal ideas, was anticipated in this study. Such were his methods.

Mr. Peirce's personality was affected by a superficial reticence often associated with the scientific temperament. He readily gave the impression of being unsocial, possibly cold, more truly retiring. At bottom the trait was in the nature of a refined shyness, an embarrassment in the presence of the small talk and introductory salutations intruded by convention to start one's mind. His nature was generously hospitable; he was an intellectual host. In that respect he was eminently fitted to become the leader of a select band of disciples. Under more fortunate circumstances, his academic usefulness might have been vastly extended. For he had the pedagogic gift to an unusual degree, had it by dower of nature, as some men handle a pencil and others the bow of a violin. It may be an inevitable result of the conventional system of education, but it is none the less a sad one, that his type of ability does not flourish readily in an institutionalized atmosphere; and no university had a more wholesome atmosphere than had Johns Hopkins in those days. The moral, if there be one, is that systems must give way to personalities, if the best talents of the best men are to be available.

The young men in my group who were admitted to his circle found him a most agreeable companion. The terms of equality upon which he met us were not in the way of flattery, for they were too spontaneous and sincere. We were members of his "scientific" fraternity; greetings were brief, and we proceeded to the business that brought us together, in which he and we found more pleasure than in anything else. This type of cooperation and delegation of responsibility came as near to a pedagogical device as any method that he used. One instance of it stands out with embarrassing clearness. To my consternation I was informed by Mr. Peirce that he would be absent at the time of the next lecture in logic, and that he would like me to present the next stage in the development of his topic to the class of graduate students. About half the hour was over, when Mr. Peirce walked in, took his place and insisted upon my concluding the exercise. I know of no more enlightening comment upon the atmosphere of the place and the day than that the procedure was accepted naturally by all concerned except myself.

It should be mentioned that during these years Mr. Peirce was

language, and remains an admirable example of his thought and the finish of his art. The interplay of logical and psychological as a fertile principle of interpretation; habit; the trend was biological, the product of discipline and the inspiration of general teaching that gave the humanistic value that made him the father of pragmatism, distinct pedagogical value; it made the student discussions by adding a moderate interest. "In point of fact a syllogism in Barbauld we irritate the foot of a decapitated idea, he concludes: "Although these generalizations, may seem very fanciful, the reader reflects upon them, the more confident they will appear. They give a system of formal logic which no other can

My predilections at that formative stage were rather negative. My college course had been likes, not violent, but distinctive. But as a student in philosophy. Mr. Peirce's was my first real experience of intellectual maturity. In the laboratory of psychology when I was at Hall, it was Peirce who gave me my first real psychological problem, and at the same time esteem by entrusting me, then fairly young, with a real bit of research. I was given a room, which I took to my room, instead of a laboratory, which, when conditions of illumination were not perfect. The results were published in the *Proceedings of the National Academy of Sciences* that traces of sensory effect too slight to be conscious could none the less influence behavior. It had been a persistent motive that induced me to write the book on "The Subconscious."

As a further illustration of his formative cooperative stimulus I mention his student's use of an elaborate question-sheet regarding the mind and body, mode of work, stages of growth at all times. He invited a small group of students to write the chief biographies of great men and might furnish the entries for the syllabus for the discussion and tabulation of

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continuing his work in the
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UNIVERSITY OF WISCONSIN

CHARLES S. PEIRCE AND OF HIS P

THOUGH I have not st
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intellectual rovers who, in their search for new fields, venture into the thick jungle that surrounds the little patch of cultivated science. They are not gregarious creatures, these lonely pioneers; and in their isolation they often completely lose touch with those who tread only the beaten paths, so that no one learns of their green pastures or knows their final burial ground. Those that return to the community often speak of strange things or use strange words; and it is but seldom that they arouse sufficient faith for others to follow them and change their trails into high roads.

Few nowadays would question the great value of these pioneer minds; and it is often asserted that universities are established to facilitate their work, and prevent it from being lost. But universities, like other well-managed institutions, can find place only for those who can work well in harness. The restless, impatient minds, like the socially or conventionally unacceptable, must thus be kept out, no matter how fruitful their originality. Charles S. Peirce was certainly one of these restless pioneer souls with the divine gift of seeing the hitherto invisible. In his early papers, in the *Journal of Speculative Philosophy*, and in his later papers, in the *Monist*, we get indeed glimpses of a vast philosophic system on which he was working with an unusual wealth of material and apparatus. He had, indeed, one of the most essential gifts of successful system builders, the power to coin an apt and striking terminology. But I am not certain that he could ever have completed this work, i. e., I can not in my own imagination see how the various lines of his thought can be made to meet. However, that his was a mind unusually fruitful in strikingly original suggestions, no careful, open-minded reader of his writings will deny. That these writings have been so sadly neglected—that even now no collected edition of them is available—is to be accounted for only by the fact that isolation and neglect are the penalty for those who stray from the beaten path and refuse to bow to the reigning idols.

In one respect Peirce has certainly been most fortunate. Two such gifted and powerful minds as those of William James and Josiah Royce have been able to follow some of the directions from his Pisgah heights and have thus conquered rich philosophic domains. That further domains await those who can decipher other of his cryptic directions can, of course, only be a question of faith.

Of Royce's indebtedness to Peirce an eloquent testimony is contained in the preface to the "Problem of Christianity." In view, however, of Professor Howison's misunderstanding of that passage and its motive,¹ a student of Professor Royce may be allowed to

¹ *Philosophical Review*, May, 1916, p. 240.

testify to the frequency has, in his lectures and s Besides, did not Profess to Peirce in the preface t Any one who reads Peirce himself something of the of modern mathematical ophy. Royce's doctrines community, and of the p cipated in some of Peirce resemblances may be due close students of the fre of Schelling. But in som the nature of mathematic Peirce very closely.

James's indebtedness become widely known. B James was no less indebt cism. It was the intellectu Charles S. Peirce that d against the transcendent that day.² Wright's influ empiricism of Mill and Ba ogy." The unquestioning that everything that happ these laws, was one of the distinctive note of his r "block universe" and the and growing, James was i and Boutroux.

One of our American n tion dismisses Peirce briefl fectly true as far as it goe problems of geodesy and h researches on the pendulu investigators in this field to which he was the first A tion to his paper, and m edged their obligation to l

² *Monist*, Vol. II., pp. 537 ff.

³ See preface to James's "Believe."

⁴ See Plantamour's "Recherches sur le mouvement d'un pendule et des ses sup

volving fine measurement, with the correlative investigations into the theory of probable error, seem to have been a decisive influence in the development of Peirce's tychistic philosophy. Philosophers inexperienced in actual scientific measurement may naïvely accept as absolute truth such statements as "every particle of matter attracts every other particle directly as the product of their masses and inversely as the square of the distance," or "when hydrogen and oxygen combine to form water the ratio of their weights is 1:8." But to those who are actually engaged in measuring natural phenomena with instruments of precision, nature shows no such absolute constancy or simplicity. As every laboratory worker knows, no two observers, and no one observer in successive experiments, get absolutely identical results. To the men of the heroic period of science this was no difficulty. They held unquestioningly the Platonic faith that nature was created on simple geometric lines, and all the minute variations were attributable to the fault of the observer or the crudity of his instruments. This heroic faith was, and still is, a most powerful stimulus to scientific research. But few would defend it to-day in its explicit form, and there is little empirical evidence to show that while the observer and his instruments are always varying, the objects which he measures never deviate in the slightest from the simple law. Doubtless, as one becomes more expert in the manipulation of physical instruments, there is a noticeable diminution of the range of the personal "error," but no amount of skill and no refinement of our instruments have ever succeeded in eliminating irregular, though small, variations. "Try to verify any law of nature and you will find that the more precise your observations, the more certain they will be to show irregular departure from the law."⁶ There is certainly nothing in our empirical information to prevent us from saying that all the so-called constants of nature are merely instances of variation between limits so near to each other that their difference may be neglected for certain purposes. Moreover, the approach to constancy is observed only in mass phenomena, when we are dealing with very large number of particles; but social statistics also approach constant ratios when the numbers are very large. Hence, without denying discrepancies due solely to errors of observation, Peirce has certainly ground for his contention that "we must suppose far more minute discrepancies to exist owing to the imperfect cogency of the law itself, to a certain swerving of the facts from any definite formula."⁶

To this belief in absolute chance variations, Peirce joined the doctrine that the limiting ratios which we call the laws of nature are

⁶ *Monist*, Vol. II., p. 329.

⁶ *Monist*, Vol. I., p. 165.

themselves slowly changing : Peirce's grandiose conception, ularity is itself the result of a habitual with things. A good sounds mythologic, yet it is in mythology according to which are a delusion. By denying th in being, the mechanical phil crease in the diversity and spe must have been from the begi tion of Maxwell that the func are made, are to-day precisel creation.⁷

The following,⁸ published leads to radical empiricism. doubt. We must begin with have. These prejudices are n are things which it does not person may, it is true, in th doubt what he began by believ he has a positive reason for i Maxim."

"Philosophy ought to imi ods, so far as to proceed only subjected to careful scrutiny and variety of its arguments Its reasoning should not form

James certainly shared Pe in the early stages of any in ence of thought is the wholes really sure to be wrong"; an attitude toward that outer t mans and their admirers: " those books which are so thc quirer feels that he is oblige grossed by their perusal that their ideas and to reject them

In his "Pluralistic Univer to the similarity between th creative evolution of Bergson

⁷ Maxwell, in the conclusion to

⁸ *Journal of Speculative Philo.*

⁹ *Monist*, Vol. VII., p. 20.

and growth to the nature of things,¹⁰ Peirce's approach has marked logical advantages. Bergson relies heavily on certain details not very accurately reported, as, *e. g.*, the supposed identity of the vertebrate eye and the eye of the scallop or pecten, which ignores the fact that similarities of this kind may be readily explained by the mechanical principles of convergent evolution. Peirce relies more on the general logic of specificity and individuality, into which the facts adduced by Driesch may well fit, but which have a much wider appeal since they are also applicable to the facts of inorganic nature, and can not be refuted by considerations drawn from experimental biology.

A closer similarity seems to me to exist between the tychism of Peirce and the probabilism of Cournot. Both vigorously opposed that blind anacism or mechanical necessity which has become the sacred cow of scientific orthodoxy, at the same time that they extended the range of our scientific knowledge. Both also relied on the method of infinitesimals, not in the obscurantist way which forms the basis of the general distrust of that concept, but in a way to keep the respect of a mathematician like Poincaré.¹¹ Cournot's massive books give the impression of a more delicate and finished mind, possessed also of a greater power of organizing his material which comes with self-mastery, but Peirce appears to me decidedly the more unconventional and the more fruitful of original insight. Peirce also had a vastly greater and more intimate knowledge of factual details, both of the history of human thought and of logical mathematical and physical methods. He knew enough of medieval logical terminology to make corrections in a work as erudite as Prantl's logic; and whenever he refers to writers like Aristotle or Kant his analyses show thorough mastery.¹² The same is true (so far as I can follow him) of his references to modern mathematical, astronomical, physical, and chemical researches. Yet his own original contributions entitle him to be regarded as one of the founders of modern symbolic logic.¹³ Cournot has made more substantial contributions to the theory of history and of economics. But we gather from Peirce's chance remarks, such as his characterization of the Mugwump,¹⁴ or of that which produces dominant opinion among professors,¹⁵ that his eye

¹⁰ Both Peirce and Bergson believe that on other than practical subjects natural selection need not favor our attaining truth.—*Popular Science Monthly*. Vol. XII., p. 3.

¹¹ *Revue de Métaphysique et de Morale*, Vol. XIII., p. 293.

¹² See, *e. g.*, his reference to Kant's "Transcendental Esthetic," *Journal of Speculative Philosophy*, Vol. II., p. 107.

¹³ Schroeder, "Algebra der Logik," Vol. I., pp. 107 ff. Russell, "Principles of Mathematics," pp. 23, 376.

¹⁴ *Monist*, Vol. II., p. 552.

¹⁵ *Ibid.*, Vol. VII., p. 20.

for social facts was not un-
sidered a sign of scientific
changes as due to an imman-
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succession of images.¹⁶

Recent neo-realism will
vigorous anti-nominalism, a
modern tendency to regard
view that the laws of logic
that propositions are true be-
answers: "Exact logic will
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about."¹⁷ "The question of
thinking. . . . It is not in-
premises are accepted by the
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Since the days of Locke
entirely dominated by the
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also throw light on the ve-
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¹⁶ *Journal of Speculative Philosophy*

¹⁷ *Monist*, Vol. VII., p. 27.
p. 207; *Popular Science Monthly*

¹⁸ *Popular Science Monthly*

experiment, and to his treatment of the question how it is that in spite of an infinity of possible hypotheses man manages to make so many successful inductions.¹⁰

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I. Writings of General Interest.¹

A. Three papers in the *Journal of Speculative Philosophy*, Vol. 2 (1868).

1. "Questions Concerning Certain Faculties Claimed for Man," pp. 103-114.
2. "Some Consequences of Four Incapacities," pp. 140-157.
3. "Ground of Validity of the Laws of Logic," pp. 193-208.

These three papers, somewhat loosely connected, deal mainly with the philosophy of discursive thought. The first deals with our power of intuition, and holds that "every thought is a sign." The second, one of the most remarkable of Peirce's writings, contains an acute criticism of the Cartesian tradition and a noteworthy argument against the importance of "images" in thinking. The third contains, *inter alia*, a refutation of Mill's indictment of the syllogism.

B. Review of Fraser's "Berkeley," in the *North American Review*, Volume CXIII. (1871), pp. 449-472.

This paper contains an important analysis of medieval realism, and of Berkeley's nominalism. (A Scotist realism distinguishes Peirce's pragmatism from that of James.)

C. "Illustrations of the Logic of Science," in *Popular Science Monthly*, Vol. XII.-XIII. (1877-1878).

1. "The Fixation of Belief," Vol. XII., pp. 1-15.
2. "How to Make Our Ideas Clear," Vol. XII., pp. 286-302.
3. "The Doctrine of Chances," Vol. XII., pp. 604-615.
4. "The Probability of Induction," Vol. XII., pp. 705-718.
5. "The Order of Nature," Vol. XIII., pp. 203-217.
6. "Deduction, Induction, and Hypothesis," Vol. XIII., pp. 470-482.

These six papers give the most readable account of the results of Peirce's reflection on logic. The second paper is the one to which James refers as the source of pragmatism.

D. Ten papers in the *Monist*, Vols. 1-3 (1891-1893) and 15-16 (1905-1906).

1. "The Architecture of Theories," Vol. 1, pp. 161-176.
2. "The Doctrine of Necessity Examined," Vol. 2, pp. 321-337.
3. "The Law of Mind," Vol. 2, pp. 533-559.
4. "Man's Glassy Essence," Vol. 3, pp. 1-22.

¹⁰ *Monist*, Vol. VII., p. 206; *Popular Science Monthly*, Vol. XIII., pp. 213 ff., and his essay in "Logical Studies," pp. 175 ff.

¹ The following classification is arbitrary, as some of Peirce's most significant philosophic reflections occur in papers under headings II. and III. It may, however, be useful.

5. "Evolutionary Love," Vol. 3,
6. "Reply to the Necessitarians,"
7. "What Pragmatism Is?" Vol. 3,
8. "The Issues of Pragmatism,"
9. "Mr. Peterson's Proposed Dilemma,"
10. "Prolegomena to an Apology for Pragmatism," pp. 492-546.

The first six papers give the fullest exposition of Peirce's metaphysical system, i. e., of the doctrine of pragmatism. See criticism by the editor of *Vol. 3*, pp. 68ff. and 571ff., and McCrie, "Pragmatism," pp. 380ff.; cf. Dewey, "The Superstition of Pragmatism," pp. 380ff.

The last four papers develop Peirce's theory of truth and disagreement with the pragmatism of James. The last paper contains his Method of Existential Semantics.

E. "The Reality of God," in the *Open Court*, Vol. 3, pp. 96-112. (This article is one of Peirce's leading ideas.)

F. Five papers in the *Open Court*:

1. "Pythagorics" (on the history of logic), pp. 3377.
2. "Dmesis" (on charity and truth), pp. 3377.
3. "The Critic of Arguments," pp. 3394.
4. "The Critic of Arguments to Relatives," pp. 3394. (This is a very clear succinct statement of Peirce's logic.)

5. "What is Christian Faith?"

G. Articles in Baldwin's "Dictionary of Philosophy and Psychology," Vol. 1, pp. 1-10. (On kind, matter and method, and scientific method.)

H. "Pearson's Grammar of Science," Vol. 58 (1901), pp. 1-10. (On conceptualism and method of science.)

I. Numerous articles in the *Open Court*.

II. Writings of Predominantly Logical Character:

A. "Five Papers on Logic," *Academy*, Vol. 7, pp. 1-10.

1. "On an Improvement in the Method of Substitution," pp. 261. (Suggests especially in the Substitution of ability became a method.)

2. "On the Natural Character of Truth," (A suggestive contribution to the theory of truth.)

- and the premise of an argument. Contains also an interesting note (pp. 283-284) denying the positivistic maxim that, "no hypothesis is admissible which is not capable of verification by direct observation.")
3. "On a New List of Categories," pp. 287-298. (The categories are: Being, Quality (Reference to a Ground), Relation (Reference to a Correlate), Representation (Reference to an Interpretant), Substance.) "Logic has for its subject-genus all symbols and not merely concepts," Symbols include terms, propositions, and arguments.
 4. "Upon the Logic of Mathematics," pp. 402-412. "There are certain general propositions from which the truths of mathematics follow syllogistically."
 5. "Upon Logical Comprehension and Extension," pp. 416-432. (Interesting historical references to the use of these terms and an attack on the supposed rule as to their inverse proportionality.)
- B. "Description of a Notation for the Logic of Relations," in *Memoires of the American Academy*, Vol. 9 (1870), pp. 317-378. (Shows the relation of inclusion between classes to be more fundamental than Boole's use of equality. Extends the Booleian calculus to DeMorgan's logic of relative terms.)
- C. "On the Algebra of Logic," *American Journal of Mathematics*, Vol. 3 (1880), pp. 15-57. (Referred to by Schroeder as Peirce's *Hauptwerk* in "Vorlesungen über die Algebra der Logik," Vol. I., p. 107.)
- D. "On the Logic of Number," *American Journal of Mathematics*, Vol. 4 (1881), pp. 85-95.
- E. "Brief Description of the Algebra of Relatives," Reprinted from ??, pp. 1-6.
- F. "On the Algebra of Logic: A Contribution to the Philosophy of Notation," *American Journal of Mathematics*, Vol. 7 (1884), pp. 180-202.
- G. "A Theory of Probable Inference" and notes "On a Limited Universe of Marks" and on the "Logic of Relatives" in "Studies in Logic by members of the Johns Hopkins University," Boston, 1883, pp. 126-203.
- H. "The Regenerated Logic," *Monist*, Vol. 7, pp. 19-40.
 "The Logic of Relatives," *Monist*, Vol. 7, pp. 161-217. (An elaborate development of his own logic of relatives, by way of review of Schroeder's book.)
- I. Miscellaneous Notes, etc.
1. Review of Venn's "Logic of Chance," *North American Review*, July, 1867.
 2. "On the Application of Logical Analysis to Multiple Algebra," *Proceedings of the American Academy*, Vol. 10 (1875), pp. 392-394.

3. "Note on Grassman's 'Calculus of Extension.'" *Proceedings of the American Academy*, Vol. 13 (1878), pp. 115-116.
- < 4. "Note on Conversion," *Mind*. Vol. I, p. 424.
5. "Notes and Additions to Benjamin Peirce's 'Linear Associative Algebra,'" *American Journal of Mathematics*, Vol. 4 (1881), pp. 92 ff., especially pp. 221-229.
- } J. Articles in Baldwin's "Dictionary of Philosophy" on laws of thought, logic (exact and symbolic), modality, negation, predicate and predication, probable inference, quality, subject, syllogism, theory, universal, validity, verification, whole and parts.

III. Researches in the Theory and Methods of Measurement.

A. General and Astronomic.

1. "On the Theory of Errors of Observation," *Report of the Superintendent of the U. S. Coast Survey for 1870*, pp. 220-224.
2. "Note on the Theory of Economy of Research," *Report of the U. S. Coast Survey for 1876*, pp. 197-201. (This paper deals with the relation between the utility and the cost of diminishing the probable error.)
3. "Ferrero's Metodo dei Minimi Quadrati," *American Journal of Mathematics*, Vol. I (1878), pp. 55-63.
4. "Photometric Researches," *Annals of the Astronomical Observatory of Harvard College*, Vol. 9 (1878), pp. 1-181.
5. "On the Ghosts in Rutherford's 'Diffraction Spectra,'" *American Journal of Mathematics*, Vol. 2 (1879), pp. 330-347.
6. "Note on a Comparison of a Wave-Length with a Meter," *American Journal of Science*, Vol. 18 (1879), p. 51.
7. "A Quincuncial Projection of the Sphere," *American Journal of Mathematics*, Vol. 2 (1879), pp. 394, 396.

B. Geodetic Researches. The Pendulum.

1. "De l'influence de la flexibilité du trépied sur l'oscillation du pendule à réversion," Conférence Géodésique Internationale (1877) Comptes Rendus, Berlin, 1878, pp. 171-187. (This paper was introduced by Plantamour and was followed by the notes of Appolzer.)
2. "On the Influence of Internal Friction upon the Correction of the Length of the Second's Pendulum," *Proceedings of the American Academy*, Vol. 13 (1878), pp. 396-401.
3. "On a Method of Swinging Pendulums for the Determination of Gravity proposed by M. Faye," *American Journal of Science*, Vol. 18 (1879), pp. 112-119.
4. "Measurement of Gravity at Initial Stations in America and Europe," *Report of the U. S. Coast Survey*, 1876, pp. 202-237 and 410-416.

5. "Flexure of Pendulum Supports," *Report of the U. S. Coast Survey*, 1881, pp. 359-441.
 6. "On the Deduction of the Ellipticity of the Earth from the Pendulum Experiment," *Report of the U. S. Coast Survey*, 1881, pp. 442-456
 7. "Determinations of Gravity at Stations in Pennsylvania," *Report of U. S. Coast Survey*, 1883, Appendix 19 and pp. 473-486.
 8. "On the Use of the Noddy," *Report of the U. S. Coast Survey*, 1884, pp. 475-482.
 9. "Effect of the Flexure of a Pendulum upon the Period of Oscillation," *Report of the U. S. Coast Survey*, 1884, pp. 483-485.
 10. "On the Influence of a Noddy, and of unequal Temperature upon the Periods of a Pendulum," *Report of the U. S. Coast and Geodetic Survey* for 1885, pp. 509-512.
- C. "On Small Differences in Sensation" (in cooperation with J. Jastrow), *National Academy of Sciences*, Vol. 3 (1884), pp. 1-11.

IV. Philologie.

- "Shakespearian Pronunciation" (in cooperation with J. B. Noyes), *North American Review*, Vol. 98 (April, 1864), pp. 342-369.

The following were among the papers read by Peirce before the National Academy of Sciences:

- "The Classification of the Sciences." April, 1902.
 "The Postulates of Geometry." April, 1902.
 "The Color System." April, 1902.
 "Note on the Simplest possible Branch of Mathematics." April, 1904.
 "Topical Geometry." November, 1904.
 "The Relation of Betweenness and Royce's O Collection." November, 1905.
 "Existence Graphs." April, 1906.
 "Phanerescopy." November, 1906.
 "History of Signs, Relations, and Categories." November, 1906.

Judged by the abstracts of the paper on "Topical Geometry" which appeared in the daily newspapers (no official account is published), it must have dealt with the logic of topology—as an instance of the logic of non-quantitative mathematics. Peirce alludes to the subject in the *Monist*, Vol. 7, p. 205. Its publication would be of great value.

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REVIEWS AND ABSTRACTS OF LITERATURE

Probleme der Entwicklung des Geistes. Die Geistesformen. SEMI MEYER
Leipzig: Verlag von Johann Ambrosius Barth. 1913. Pp. iv + 429.

Here is a serious valuable discussion of practically all the deeper questions that to-day confront pioneers in the land of psychology, a discussion carried forward with important logical and metaphysical problems occasionally in mind. Of books on mental development, it treats the widest range of topics and is often most penetrating, although students of psychology will miss many familiar captions from the table of contents. The treatment has both originality and charm, the latter consisting of a steady unfolding of the argument and frequent sympathetic pictures of actual mental life. Many problems are stated and deliberately left unanswered, but I lay down the book with the reflection: Here is a new whole picture of the mental life, one that makes genial important contributions to current discussions in psychology and logic. It contains no specific references and no bibliography, but doctrines from practically the entire literature of the subject are alluded to and discussed.

Meyer disclaims any world-view that might influence his treatment except the convictions, that in this world something can really begin to be and that the human mind is not the goal toward which all development points. Every bearer of spiritual energies possesses, in the form of mental life with which it is endowed, as good a goal of development as does man. Development is always complete, but never at an end. It is nowhere constant; it nowhere results from permanently active forces comprehended in life itself; it is not in itself a property of life. Development is creation, not an unfolding of given or implicit possibility. There is a struggle for existence. The world is not a well-ordered unity, but a world in which accident gives rise to new creations which are the variations out of which the life-struggle selects. Practise is not the highest functional principle of development, and it is the last force to be regarded as creative. Practise is a form of learning, of memory-functioning, and between memory and heredity there is no bridge. Practise establishes more firmly relations of movement to stimulation, but it possesses no power to improve performances of any kind; and no function can create its organ through practise. Performances are improved through ever finer discriminations and ever farther reaching adaptations of movements to ends held in view. That every form of activity becomes easier and better by repetition is a profound error.

The origin of consciousness is bound up with organic evolution, and to read into primitive organisms the volitions of mature men, or the consciousness men have of their activities, is wholly unwarranted by facts. On the other hand, the life of an organism and the work of a machine are not comparable. The fundamental functions of consciousness are discrimination and choice; and consciousness consists of its phenomena. It is hardly possible to determine where consciousness first appears. Its distinguishing mark has not yet been found, and it may well happen that a proof will one day be forthcoming that there can as little be such a thing

as a squaring of the circle. In general, the capacity of any creature, in the light of experience, to change his response to stimulation can be said to be the work of consciousness, and many investigators incline to regard this as its lowest form. Memory is not the mark of consciousness. There must be an original consciousness consisting of a timeless- and spaceless-sensing, that assists in simple discriminations between present stimulations, before memory can come and mediate a comparison with earlier experienced impressions (*Eindrücke*).

First is the world, and then comes man; but he comes not as a goal and completion; he comes as a bit of life, as a tiny bit of the whole of life, and as a disappearing appearance in the driven incidents of the world, possessed of a mind endowed only to meet the needs of life and not to unite in itself the streaming tendencies of the universe. The world does not mirror itself in our consciousness: its forms are created as aids of life: sensations, the earliest building stones of consciousness, are primarily signals, and further, the usufruct of intensities of stimulation that owing to their diminutive energies could not move the body as a whole. There are certainly, in the great world of life, more forms of sensation than we possess, and it is possible that certain creatures are more richly endowed than we are. Our senses are accidental creations, mere outposts, whose significance is derived entirely from their connections with other and more elaborate modes of response. Knowledge of the world arises solely as the after effect in consciousness of our movements.

Feeling arises out of a conflict of inner tendencies and demands. Without such a conflict, no function for feeling is recognizable and there is no aim. For that reason feeling is a relatively late acquisition of the mental life. There is something in the James-Lange theory of the emotions, but feeling is no mere sensation of bodily processes; for the body could not evaluate, there is no mechanism of the brain for it. With evaluation begins the realm of purely mental (or spiritual) laws. The problem of the origin of feeling points unmistakably to behavior, not to stimulation, for its solution; feeling must find possibilities of movement already there. As the basis of valuation, and so of choice, it gives to the mental context its character and coherence.

Instincts do not arise from volitions, and the word impulse only names, it does not explain, the connection between stimulation and response in them. The problem of the origin of that connection is for us unsolvable. Feeling comes later than sensation and perception, pain being a relatively recent acquisition. Feeling takes the place of instinct as a guide of movements, and man behaves only through feeling. The very few instincts that remain to him must be coupled with feelings in order not to disappear from life. Animals are probably not moved by feeling to protect themselves. Expressive movements of course preceded the feelings they express.

Memory appeared late in the animal series. Recall is a special case of memory, not the conscious side of all of it. Memory underlies our total knowing, but knowing is timeless, and recall involves the time-relation. There is a timeless memory upon which we rely all day long, and no lower

animal possesses a temporal memory. Memory is nothing less than it is a time-consciousness. Memory works mechanically, not according to mental laws: it is only capable of providing a material for the activity of consciousness, and again, of preserving the results of mental activity. The actual course and content of memory is in part the result of selection and interest, which are mental functions; but these are not in any sense functions of memory. Our thinking is of a character to be served by the brain-mechanism that underlies memory, and where that fails the mind has no means of filling out the breach.

Will is not the mover of the body: the latter moves itself: its movements must have already been constructed either in the development of the species or in the life and learning of the individual: the will simply takes in hand the work of making behavior significant to the agent. No movement is thinkable without some stimulation *ab extra*, for will can not take the place of stimulation. An end is the essence and actual being of will, and there is no will where there is no opposition to the even course of customary activities. Man is dependent upon acquiring will, for which he is chiefly indebted to culture, *i. e.*, to the spiritual community for which he is born. We do not will our movements, we will results, and results do not rest on knowing how to move. We note the result, remember it, and even connect it in perception with the stimulation that gave rise to the movement; but no direct way leads from the subsidence of hunger as a result of eating to the construction of the eating movement. There are no unconscious or subconscious mental activities. Skill and technique depend upon acquiring an appropriate perception of the object, and this remains in memory like any other temporal and spatial combination. Of special importance are inherited adjustments due to the direction and distance of the source of stimulation, especially those connected with sight and hearing, for, to the building of movements, they contribute the indispensable space element. It is a result of these movements, known only to scientists, that we construct a unified visual space into which we translate all space-experience.

The mechanization of conscious processes through fixing them by practise is clearly possible; while consciousness, thus freed from the work of carrying on these acts, devotes itself to other attainments, and so multiplies its effects. Consciousness thus abbreviates, while memory supplements and completes, its activities. The aims that occupy the attention in volition continually undergo reconstruction in these ways: Every step of growth in mental media brings new aims in sight. Hence, no aim, such as the aim of any act of ours, precedes evolution.

Perhaps the most interesting section of Meyer's book is devoted to complementation and abbreviation (*Ergänzung und Verdichtung*). Here the work of memory is represented as linking together, always in the service of behavior, not images, but things and occurrences, and thus providing the materials on which conscious activity works. The linkages are not mysterious mental bonds of association, but activities of a mechanical type in which our bodily-mental organism is either directly or indirectly involved. Memory produces linkages in the contents of life itself, and

Meyer questions whether images are in themselves of any importance in memory activity. Memory can only work the past into the present situation, the most useless definition of it being the power of representing absent things. Memory saves us from beginning at the beginning of experience every time we do anything. We need above all the vast supplementation of the present that comes from knowing and remembering the experience of predecessors, the use (*Gebrauch*) of the object (*Gegenstand*) being the fundamental relations to which all its properties are subordinated. Movements are constructed by the mind itself only on the highest planes of life.

Memory does not in the least account for or create unity, unification, and judgment. Feeling, interest, and will, the conscious setting of ends, are appealed to to account for the unity of the thing in perception and, I may as well add, the unity of consciousness and personal identity. The unification of the thing in perception is rather a presupposition of memory activity than one of its performances: and yet, unification is not "the work of the mind" so much as a result of many factors, among which memory must be counted. In dealing with the problem of unity, the temptation is especially great to assume in an explanation what is to be explained (as Kant did). It is not the mind that produces unities by its activity, but consciousness consists of unitary constructions: out of the given contents, taken together with those supplied by memory, new unities develop by a law of their own. Unity is for consciousness a necessity, but it is no force that can create anything at all. It is indeed a limitation. The forms of unification, such as simple combination and blending, abbreviation (*Verdichtung*), simplification and representation, are not forms of the activity of consciousness; they are results which we are conscious of. The correlating and organizing processes that result in unity are extra-conscious: they are not even mental. The important side of the unity of consciousness is the attitude of the organism toward the outer world. This unity of attitude toward things is an effect of nervous functions, and their unity is a presupposition of the much discussed unity of consciousness. Certain it is that the connection of stimulation-reception to response must take place through nervous transmission; and just as certain is it that mental unity is something more than a process organized like a nervous function. The unity outward can only spring from a peculiar inner unity, which at bottom is volitional. The will consists in nothing but the fact that one thing is subordinated or suppressed by another; and in no one person could one will get along with another, for their demands would struggle for precedence. Most of the difficulties of the problem of unity of consciousness result from the fact that all contents of experience are transformed into things by being thought. (We who speak English can only envy the users of a language containing such words as *Verdinglichung*.) Our will each moment is our self; our whole individuality is a will-unity (*Willenseinheit*); but the unity of the will is nothing but the sum of our bodily and mental functions concentrated upon an end. So long as oscillation continues, the personality shows its unity just in the necessity of coming to a conclusion. There is no partial will, for will is

only capable of a complete unity. And yet, only a living being that from the first prepares to build a spiritual community could with success, and then with such enormous success, enter into a life directed and judged according to ends. A solitary individual could never acquire such knowledge as to render his life secure, and even the step of individuating the simplest thing presupposed at least the beginning of a community in which one imitates another. And the first *thing* is an instrument, in which one property predominates over all others.

Space-perception begins with the apprehension of the directions in which we approach things and see them affect us. The senses are from the first accommodated to the direction of stimulation, and this accommodation is a directing of the attention toward the thing. The space of science with its three dimensions, its continuity and uniformity, its conceivable emptiness, its endlessness and endless divisibility—scientific space is a concept which a man who does not think scientifically is not able to construct at all. We never perceive space of this sort: we perceive the location of a thing. And there is no end to the number of directions possible to stimulations and movements. There is no special space-sense, although vision predominates in space-perception. The controversy whether space-perception is inherited is an idle one: many of its conditions are inherited, but every space relation is an experience. It is not a thing, although psychologists and other scientists alike tend to think of the space of science as a thing. Primarily it is nothing but the measure and direction of movements.

Experience is primarily timeless; in joining an earlier event with the present, it merely works the past into the present: through memory, the past becomes again effective, and so a piece of the present. A time-consciousness is a purely human possession; and, for that reason, no animal has a genuine life course or destiny. The time-consciousness does not rest upon the consecutive flow of mental states. A creature that adapts himself only to the immediate present constructs no time-consciousness. The occasion for comparing a present situation with any other can only arise out of an urgency to use the present for the activity of another time; and only a being that himself sets ends for his actions comes into a position to order his experiences in this way. The beginning of the time-consciousness is not at all the antithesis of past and present: the present is first contrasted with a future held before the eyes. In retrospect, when the future has become the present, the former present has become a past. Only one who makes plans for the future looks back into a past (p. 394). Things and events do not exist *in* space and time, space and time exist in them.

The attempt in a review to give a book of such scope as this one is perhaps foredoomed to failure; and yet, such an attempt, in this case, seemed more worth while than any brief discussion of special points. Meyer maintains that mental development will always be a field of controversy, and what might be called the pluralistic biological tychism of the work is sure to provoke opposition. Especially the dualism of "mechanical" memory activity, instinct, and habit in antithesis to mental activity

with its laws of discrimination, evaluation, and choice, seems to be an intolerable gap in the theory. But the book, as a whole, rings true. Especially those who are interested in the instrumental view of consciousness, and the behaviorists, with their new philosophy of mind, should welcome it. And Meyer's contention, that any doctrine of human knowledge that does take mental development into account must be judged unfruitful, is supported by a weighty mass of evidence in this book.

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The Yoga-System of Patañjali, or the Ancient Hindu Doctrine of Concentration of Mind, Embracing the Mnemonic Rules, Called Yoga-Sūtras, of Patañjali, and the Comment, Called Yoga-Bhāṣya, Attributed to Veda-Vyāsa, and the Explanation, Called Tattva-Vāiṣṇadī, of Vāchaspati-Miśra. Translated from the original Sanskrit by JAMES HAUGHTON WOODS. Harvard Oriental Series, Edited by Charles Rockwell Lanman, Vol. 17. Cambridge, Mass.: The Harvard University Press, 1915. Pp. xlii + 384.

This contribution to the Harvard Oriental Series, by Dr. Woods, professor of philosophy in that university, continues the tradition of austere scholarship manifest in earlier volumes. No translation of either the "Comment" or the "Explanation" has before been published in America or Europe, and since the bare Sūtras can be crowded into ten pages of text, by far the major portion of this solid tome is unique in the West. Without it as a source there can hereafter be no serious study of the Yoga philosophy unless by the few who are willing to rely on their own reading of Sanskrit.

To the Yoga Sūtras Dr. Woods ascribes a date as recent as A.D. 300-500, the commentary being placed at 650-850 and the sub-commentary at about A.D. 850. This does not mean, however, that there was no Yoga before Patañjali wrote. In order to get the full meaning from the text one needs to practise upon it some of the Yoga methods of concentration. Besides the ordinary difficulties of entering into an alien philosophy are the special ones of catching abnormal mental experiences. Impossibility of accurate reproduction in words is a trait of mystical conditions the world over. A cynic falling upon some parts of the commentaries would say that they were intended to befog the Sūtras. This, however, is not quite fair; they contain much that is illuminating. But they multiply manifold the problems of exegesis, and it is well understood, of course, that a native Oriental commentator, although standing nearer the original author, is often less able to judge his meaning than is the modern critic.

Yoga is familiar by name and in general character as one of the six orthodox philosophies within Hinduism. Very imperfectly we might distinguish it from the two others most celebrated by saying that, while the Vedānta follows pantheistic idealism and the Sāṅkhya atheistic dualism, the Yoga is a mildly theistic variant of the Sāṅkhya, but is chiefly concerned with ways and means of self-hypnotism. Yoga, a word cognate

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... is often taken to mean union with Deity. ...
 ... however, the end of the Yoga's endeavors is ...
 ... that is to say, a realization that he is a part ...
 ... universal, but not now regarded in its divine identity ...
 ... independent of individual body and soul with their vicissitudes. ...
 ... differentiation is produced, the Self is seemingly perturbed by the ...
 ... of the organism with which it is associated and confused. The ...
 ... reflected in the waves.
 ... on or discrimination is brought about by concentration. With ...
 ... weakening hindrances there are several, such as suppression of ...
 ... or its study, morose, sympathy, postures, breathing exercises, etc.
 ... to Iyana, the Luri. The last mentioned is coordinated with other ...
 ... and Iyana is not here represented as the Infinite Goal.
 ... Dr. Woods considers a primary historical importance of these texts ...
 ... the formation of "a bridge between the philosophy of ancient India ...
 ... and the fully developed Indian Buddhism and the religious thought of ...
 ... day in eastern Asia. . . . For this system, together with the Nyāya and ...
 ... Vaiśeṣika systems, when grafted upon the simple practical exhortations of ...
 ... the primitive Buddhism, serves as an introduction to the logical and meta- ...
 ... physical masterpieces of the Mahāyāna." Presumably he refers to in- ...
 ... ences upon Buddhism much later than the first infiltration of practice ...
 ... resembling the Yoga. Some of the oldest books of the Pāli canon show the ...
 ... Jñāna trances to be in vogue. Thus the Vinaya and Nikāyas contain ...
 ... minute instructions for the breathing exercises, and it is asserted that ...
 ... his followers is proved by the attention they receive in such primitive con- ...
 ... positions as the Thera-Gāthā hymns, and it is hardly conceivable that ...
 ... they could have found so large a place thus early without the Master's ...
 ... favor. These mysteries should not, however, be called Yoga in too tech- ...
 ... nical a sense, but regarded as springing from a root common to Hinduism ...
 ... which later flowered most gorgeously in the Yoga cult. That there is a ...
 ... close relationship between Yoga and other orthodox sects goes without ...
 ... saying. One of the strongest impressions made by this book is its attesta- ...
 ... tion of the connection between Yoga and the heretical religion of Buddha. ...
 ... Philosophically, to be sure, they are opposites, for the existence of any ...
 ... Self that could be isolated from its natural organism was a doctrine that ...
 ... Buddha most ardently combated. Their similar ecstasies thus led to quite ...
 ... different attainments, equally satisfying to the respective votaries, a fact ...
 ... which does not strengthen the confidence of a modern critic in either one.
 ... But fruitful quest in the Sūtras for formulae cognate with Buddhist ex- ...
 ... pressions gives a relish to their perusal. Thus, the classification of pain, ...
 ... (its cause, the means of escape, and the eight aids to Yoga) is undoubtedly ...
 ... a reflex from the "Four Noble Truths" of the Dhamma. We find also ...
 ... here, as in the Tipitaka, the "Four Infinite Feelings," which characterize ...
 ... Hinduism at its best: friendliness, pity, congratulation, and peace, to adopt ...
 ... a free rendering. Among the supernatural powers produced by Yoga one ...
 ... meets the same ideas as in Pāli literature: memory of former lives, clair-

voyance, apprehension of the celestial bodies, elephantine strength, levitation, etc. Book III. of the Sūtras merits detailed comparison with the Ākankheyya Sutta, translated in Vol. XI. of the Sacred Books of the East. With Patañjali's reference to cotton-down in describing the miraculous lightness of body, compare Thera-Gāthā 104. Knowledge of the cries of animals is a fabulous power not confined to India; Philostratus, in his "Life of Apollonius of Tyana," attributes it to the Arabs. A sane lover of Buddhism, however, looks upon all such pretensions as smirch from the muddy waters of Hinduism in which it had grown and from which it could not, like the lotus in its favorite metaphor, preserve itself immaculate. One is glad to believe that its practise of trance was not vocational, but avocational.

Such works as this raise an obstinate questioning how far it is desirable to translate unconvertible and doubtful terms. Where minds have flowed in deep, un-European channels, it is impossible to express their thoughts in concise words of our language. Wine new to us requires bottles that also will be new. The wisest course in a translation for the use of scholars might be to naturalize the most important Sanskrit technical terms, richly defining them in a glossary, and thus indicating their subtle meanings more clearly than by approximations possible in the text. This would be less urgent if the English renderings were standardized, but where an effort at originality is made by each new translator the reader is confused. These observations are not to be taken, however, as an attack upon Dr. Woods, who has seen fit to aim at English equivalents for almost everything, but who has often added the originals in parentheses, besides appending an index to the Sanskrit words in the Sūtras.

Perhaps it is fortunate that the form of the Yoga Sūtras and their commentaries restricts their perusal to serious students and that hot-headed faddists will effectually be repelled. In the opinion of this reviewer at least, mysticism—especially that selfish mysticism which, like Yoga, is its own end—has ever been the bane of religion, and its engrossment of attention is largely to blame for toleration of cruelty in the world to-day. Duty is not served by intoxications which make the mind forget reality, but by keeping it clear for truth and sympathetic projection. But however dubiously we may praise the work of Patañjali and his interpreters, it is no reproach to Dr. Woods nor a detraction from the applause to which he is entitled for the achievement of his heroic task. Notable is the restraint with which he has held himself to the work of a translator and refrained from annotations other than brief technical ones. His comparative citations indeed show a wide range of study. Doubtless he holds in reserve many valuable opinions as to the meaning of the Yoga which he may disclose upon a suitable occasion. Students of philosophy and psychology, after exercising with the analyses of mental conditions now laid before them, will not feel themselves above assistance, and those who deal with morbid mentality will welcome more light upon this matchless system for crucifying sanity.

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Das Problem der Geltung. ARTHUR LIEBERT. Kantstudien. Ergänzungshefte im Auftrag der Kantgesellschaft herausgegeben von H. Vaihinger, B. Bauch und A. Liebert. No. 32. Berlin: Verlag von Reuther und Reichard, 1914. Pp. vi + 262.

The author of the present monograph in the series supplementary to the "Kantstudien" is an adherent of Neo-Kantianism, (pure logism, critical rationalism). This movement, founded by F. A. Lange¹ and Otto Liebmann² with the slogan "Back to Kant!" has perhaps as its leading representatives the celebrated school of Marburg headed by Hermann Cohen and of which Liebert himself is presumably a member (pp. 165, 238). The Neo-Kantians are quite ready to deviate from the philosophy of Kant on the ground that "the individual doctrines of the 'Critique of Pure Reason' are controversial or doubtful or disproved"; yet they claim immortality for the general position which underlies this work as a whole. The views of the school of Marburg, which differ³ in important respects from the idealism of Lange and Liebmann, are carefully outlined by Liebert, who also refers to the excellent sketch⁴ of Natorp (pp. 237-246). As Liebert says, the beginning and end of Cohen's philosophy is the concept *system* (p. 246); the fundamental rôle, therefore, ascribed to this concept by Kant is endorsed (pp. 114, 194).

As might be conjectured from the universality of system or whole in Neo-Kantian philosophy (cf. p. 186), the main thesis which Liebert seeks to establish is that system is the basis of all validity. The author confesses that certain Neo-Kantians, *e. g.*, Natorp, have maintained an attitude of reserve toward the concept of validity, possibly because they suspected that the latter was to be employed in the construction of a new metaphysics or the revival of an old, such as Neo-Fichtianism (dogmatism) which is strongly opposed (pp. 158, 174). On the contrary, metaphysics Liebert subordinates to psychology; metaphysics, indeed, is hypothesized psychology (pp. 23, 120, 247), while psychology itself is distinct from logic, in conformity with Kant.⁵ There results, then, that there are but two autonomous series of validity: the psychological and the logical. Accordingly, Liebert discusses (*a*) the psychological significance of validity (pp. 22-56) and (*b*) the logical aspects of validity (pp. 96-189). The latter Liebert considers more profound than the former and less successfully discussed by previous authors. In fact, Liebert regards the demonstration of a sphere of validity which is essentially distinct from the psychological as one of the peculiar contributions of critical philosophy. A critico-historical review dealing with relevant philosophies is appended to each section; these are primarily the philosophies of James and Kant.

System, or unity, is conceived by Liebert to be an infinite structure ordered according to laws (p. 103) as distinguished from a mere aggregate. It is not a closed or perfect totality, but an infinite problem (cf. p.

¹ "Geschichte des Materialismus," 7te Auflage (1902).

² "Kant und die Epigonen," reprinted, Berlin, 1912.

³ For example, there are diverse interpretations of Kant's "Thing-in-Itself."

⁴ "Kant und die Marburger Schule."

⁵ Cf. p. 122, note; p. 204.

234); a "continuity" in a spontaneous and autonomous state of development (pp. 114, 122, 152). System is a *fundamentum* of knowledge; every individual concept is only a determination of the thought of system with reference to a definite place in the latter (pp. 35, 109, 115). After characterizing the metaphysical and psychological concepts of system (p. 120) Liebert determines the logical concept negatively (pp. 121, 122) and finally identifies it with the idea of knowledge in a Kantian sense (pp. 122-126). Liebert discusses the psychological and metaphysical interpretations of the Kantian ideas, namely, those of Vaihinger and Fichte and then takes up the methodological meaning of the idea of system, in particular its relation to the *categories*, *induction* and *deduction*, *nature*, *mechanism*, *experience*, *teleology* and *being* (pp. 135-167). In a final section of the second part of his monograph, Liebert critically considers the ultimacy of the idea of system, especially with reference to the philosophies of Fichte, Lotze, and Münsterberg (pp. 167-182) and concludes with a defense of its autonomy. Liebert rightly observes that the writing of a history of the concept of system would be a most valuable and fascinating task. It would probably be instructive to compare in detail the properties of the Neo-Kantian conception of a whole with the Hegelian interpretation. Liebert has only a remark or two in this connection (*cf.* p. 114) and subsequently points out the lack⁶ in the literature of an exposition of the relation of Hegel to Kant (p. 192).

Referring more specifically to validity, Liebert assumes that system is the supreme determination of validity (p. 117; *cf.* p. 125). Indeed, the fundamental values of the validity of knowledge, the indispensable conditions and functions of the latter, are *concept*, *judgment*, *inference*, *method*, and *system* (p. 116). The idea of system is the pure form of the concept of validity (p. 143). Owing to the systasic quality of system an individual concept, as such, is artificial, without validity (p. 109). An individual term, then, is valid if, and only if, it is an element in the system, a part of the whole, that is, exercises a function in the system (p. 116). This functioning consists in the generation of (internal) relations which are themselves mere abbreviations of the thought of system and thus possess universal validity and necessity (pp. 115, 183). Validity appears to be synonymous with truth (pp. 109, 114, 206). It remains briefly to characterize validity with reference to being and reality. All thought possesses structure and there can be nothing external to thought (pp. 62, 143). Hence being is the thought of being. But to think is to think of something as valid; even non-validity possesses validity in thought. Therefore the thought of being implies that being is valid. Thus being is merged into validity (*cf.* p. 9). Objectivity, *i. e.*, objective validity, merely means "grounded in the fundamental laws of thought" (pp. 103, 239). Reality is not a mere fact; it is conceptual. To be real is to possess functional and categorical validity (pp. 129, 161, 183). This position, so carefully delineated by Liebert, is in the strongest possible contrast with the statement of James: "The question of being is the darkest of

⁶In a volume dedicated to Theodore Lipps, Leipzig (1911), pp. 1-25, the relation of Neo-Kantianism to Hegelianism is discussed by E. v. Aster.

all philosophy; all of us are beggars here." Such a view, one readily infers, would be rejected by Liebert as mystical (cf. pp. 55, 163) and according to him the slightest attempt to determine reality presupposes the concept of reality, and the validity of concepts is absolutely autonomous. It has become pretty well recognized, I think, that the Neo-Kantians, in adopting such an extreme standpoint, have committed an important error.

Concerning the logical position, as a whole, of Liebert and other Neo-Kantians it will perhaps suffice to note its dependence upon Lotze and his interpretation of the Platonic Ideas. The arguments of Dewey in his "Logical Studies" controverting Lotze are, of course, widely known. An opportunity for further criticism is offered by the Neo-Kantian relation of science to philosophy, or rather, the actual interpretation of this relation by individual members of the school, for, taken by itself, this part of their programme, at least as stated, *e. g.*, by Riehl, largely represents a praiseworthy ideal.⁷ On this basis, philosophy is defined⁸ to be in harmony with Windelband) the "critical science of universally valid values." Critical philosophy seeks to determine the fundamental laws of science in general. Philosophy and the positive sciences are, therefore, interdependent. Through this interaction of criticism and creation the future development of scientific philosophy will consist in the elevation of science to philosophy. Thus the importance of creative scientific activity in philosophers is clearly recognized. It would not be difficult to show that Neo-Kantians such as Cohen, Natorp, Windelband, and others have fallen lamentably short of the standard proposed by Riehl, although they assert⁹ that they are chiefly interested in the mathematical sciences. Liebert evinces the same failing: it is hardly correct for him to say¹⁰ that Kant's "Critique of Pure Reason" contains the critical foundation of Euclidean mathematics. But, whatever the mathematical deficiencies of the Neo-Kantians may be, one must admire the thoroughness, even consistency, with which Liebert and his colleagues have described their philosophy, and in particular the adaptation of the latter to the problems of validity.

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Modes of Research in Genetics. RAYMOND PEARL. New York: The Millan Company. 1915. Pp. 182.

This little volume comes as a timely addition to the working library of the modern student of biology. While three of the five chapters are substantially reprints of separate addresses or papers by the author, the fourth is based upon a series of studies published elsewhere, the fifth account marches with reasonable unity to the end without undue employment of scissors and paste.

⁷ Cf. Liebert, *loc. cit.*, pp. 249-256.

⁸ Cf. Liebert, *loc. cit.*, p. 21.

⁹ Cf. Liebert, *loc. cit.*, p. 241.

¹⁰ *Loc. cit.*, p. 111.

Although the veteran will read it with profit, the book will prove especially useful to the beginning investigator, inasmuch as it will aid materially in orienting him in the technique of his subject. The first chapter reviews and criticizes current modes of research in genetics. After a reminder that in dealing with phenomena of heredity, not only resemblance between adults, but the entire cycle of reproduction of the individual, including both gametogenesis and somatogenesis, must be reckoned with, the author proceeds to evaluate the four chief methods of investigation,—the biometric, the Mendelian, the cytological, and the embryological—by which biologists are striving to solve the problems of genetics. The advantages and limitations of each method are impartially set forth.

The second and third chapters together afford a concise and understandable summing up of the content, limitations, and real utility of biometry in genetics. They reveal convincingly its value as an indispensable refinement of the descriptive method. It is to be regretted that, for the sake of the tyro, the author did not follow up his lucid discussion of the significance of biometry by an additional chapter explaining the commoner terminology and symbols used in it together with illustrative applications.

The fourth chapter, "Certain Logical and Mathematical Aspects of the Problem of Inbreeding," although rather abruptly interjected into the book, is an interesting elaboration of a method for analyzing and expressing numerically, in the form of coefficients, degrees of inbreeding. Starting with the obvious fact that the total number of different ancestors of inbred individuals are fewer in proportion to the degree of inbreeding, down to an ultimate minimal limit, the author develops a series of values of successive coefficients of inbreeding in such matings as brother by sister, parent by offspring, cousin by cousin (single and double), and uncle by niece. The most interesting practical outcome shown in his tables and graphs is that if any of these forms of inbreeding are followed continuously, by the tenth generation there is an almost complete unification of ancestry.

The last chapter, which discusses the relation of the science of genetics to the practical art of breeding, although adding nothing to the earlier discussions of methodology, sounds a needed caution about what, particularly in the field of animal breeding, may be expected in a practical way from the application of Mendelian principles.

In conclusion, we can heartily agree with the author that "an occasional examination and overhauling of one's equipment is as essential to success in scientific operations as it is in military," and congratulate him upon his success in conducting us through the inspection.

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